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Problems Solved in Machining Large Gears

Turbine Speed-Reduction Units of Unusual Size Made at Philadelphia Navy Yard—Method of Cutting Teeth and Checking Accuracy Described

BY LEWIS H. KENNEY*

THE construction of destroyer tender No. 3, U. S. S. Dobbin, at the Philadelphia Navy Yard, and of destroyer tender No. 4, U. S. S. Whitney, at the Boston Navy Yard, was authorized by the Navy Department in 1919. About this time the construction of repair ship No. 1, U. S. S. Medusa, and submarine tender No. 3, U. S. S. Holland, at the Puget Sound Navy Yard, was authorized, and in some respects these two ships are similar to the Dobbin and Whitney. Later the cutting of the reduction gears for the four ships at the Philadelphia Navy Yard was authorized.

The U. S. S. Dobbin is designed to meet all ordinary demands of service, supplies and repairs for a group of 18 destroyers for a period of 60 days under wartime conditions. Shop facilities for this duty are installed and include pattern, foundry, general machine, electrical, forge, coppersmith, sheet metal, ship carpenter, torpedo and optical shops. The supplies carried include fuel oil, lubricating oil, fresh water, provisions, spare parts of machinery, etc. Adequate medical facilities are available and include a hospital. The principal dimensions of the Dobbin are as follows: Length overall, 482 ft., 9½ in.; beam, molded, 60 ft. 10⅛ in.; normal draft, designed, 21 ft. ⅛ in.; displacement, designed, 10,600 tons and shaft horse power 7000.

The main turbines, one high and one low pressure, are direct connected to a reduction gear. The shaft of the main reduction gear is coupled to the propeller shaft. This arrangement permits operation of the turbines at high speed and the propeller at low speed in order to obtain the best efficiencies for each. The reduction gears for the Dobbin and Whitney are identical, and those for the Medusa and Holland are identical but of somewhat smaller dimensions. The main propelling machinery of these ships was built in accordance with designs furnished by the Parsons Marine Steam Turbine Co. The detail drawings were developed by the Philadelphia and Puget Sound navy yards from these designs.

The work between the Boston and Philadelphia navy yards was divided, the making of patterns and castings for the reduction gears for the Dobbin and Whitney having been assigned to the Boston yard, and the manufacture of the reduction gears and pinions to the Philadelphia yard. The gear blanks for the reduction gear of the Medusa were furnished the Philadelphia yard and the only work involved was the cutting of the gear teeth. In the case of the Holland, however, rough machined forgings for the pinions and the steel rims only were furnished. The Philadelphia yard manufactured the shaft and the cast iron spider in addition to cutting the gear teeth.

Unusual Size of Gears Creates Shop Problems

The engineering and shop problems involved in this work were many, due to the fact that the yard had had no previous experience in work of this character; moreover, the gears of the Dobbin and Whitney and those of the Medusa and Holland are the largest ever built for marine service in this country. The method of cutting the gears and the precautions taken to assure the necessary accuracy it is believed will be of interest to others engaged in similar work. This article, therefore, has been confined to the shop problems involved in cutting these gears.

The general features of the reduction gear wheel and pinions are shown in Fig. 1. The principal dimensions are as follows:

	Gear (Inches)	Pinions (Inches)
Pitch circle diameter	146.182	9.903
Root diameter	145.6054	9.3264
Outside diameter	146.554	10.274
Width of each gear face	21	21
Circular pitch	0.676358	
Normal pitch	0.583001	
Total depth of teeth	0.4742	0.4738
Normal thickness of tooth on pitch circle	0.2827	0.2815
Normal space between teeth	0.3003	0.3015
Normal backlash	0.0188	
Number of teeth	679	46
Angle at which teeth were cut	30 deg. 27 min. 41 sec.	
R.p.m.	105	1550
Weight of the gear wheel	60,000 lb.	
Weight of each pinion	1,500 lb.	
Weight of gear shaft	13,000 lb.	

The gear shaft and wheel rims were class B forgings, Navy Department specifications, the tensile strength being 60,000 lb. and the yield point 30,000 lb. The tensile strength of the pinions, which were of nickel steel, was 95,000 lb. and the yield point, 65,000 lb.

The development of the design required consideration of shop facilities and methods. To assure accuracy in the machining of the gear shaft, hardened steel centers were inserted in each end. The usual steady rests were employed during machining operations. The cast iron spider had "supporting feet" cast on the arms, as shown in Fig. 2, and these were to be faced off radially and in planes at right angles to the axis of the gear, in order to assist in centering and supporting the gear on the gear cutter table. Several preliminary machining operations were necessary to prepare the gear blank for the gear cutter.

Several Steps Necessary Before Cutting Teeth

The spider casting was set up in a boring mill and bored to the designed taper. The outside diameter was then turned to the dimension specified. Each forged steel ring which was to be shrunk on the spider was a single forging made by a successive expansion process. These rings were first bored to the desired diameter, but a lip was left on the edge which rested on the table of the boring mill. This lip served to locate accurately the ring on the spider in its axial position before it cooled sufficiently to seize on the spider.

The gear was then assembled on its shaft, the prin-

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cipal problem being the installation of the nut, which weighed about 600 lb., on the forward end of the gear shaft. The difficulty was overcome by casting a babbitt ring which was bored to suit the shaft and turned to an outside diameter closely approximating the bore of the nut. The nut was passed over this ring and no difficulty was experienced in engaging the threads.

The assembled gear was then set up in a lathe, as shown in Fig. 2, the shaft being supported by specially designed steady bearings, as shown. The "supporting feet" were then faced in planes at right angles to the axis of the gear blank and finished radially to the dimension specified. The blank was turned to the outside diameter specified on the drawings, as well as to the widths of the gear tooth faces. The diameter of the blank was measured first by a circumference tape, and checked by means of a series of micrometer measurements, which included the diameter of the shaft, the distance from the shaft to the inside of the "supporting feet," and the distance from the inside of the "supporting feet" to the outside of the blank. These two measurements were in substantial agreement.

The pinions were machined to the specified dimensions, with the exceptions that the length of the tooth faces was left longer than specified, and the journals were machined to a somewhat larger diameter than specified for the finished journals. The latter provision was intended to eliminate the possibility of the journal being injured during machining operations. The machining of the journals to the designed dimensions was the last operation performed. The correct length of the gear faces was determined after assembly, as shown in Fig. 2.

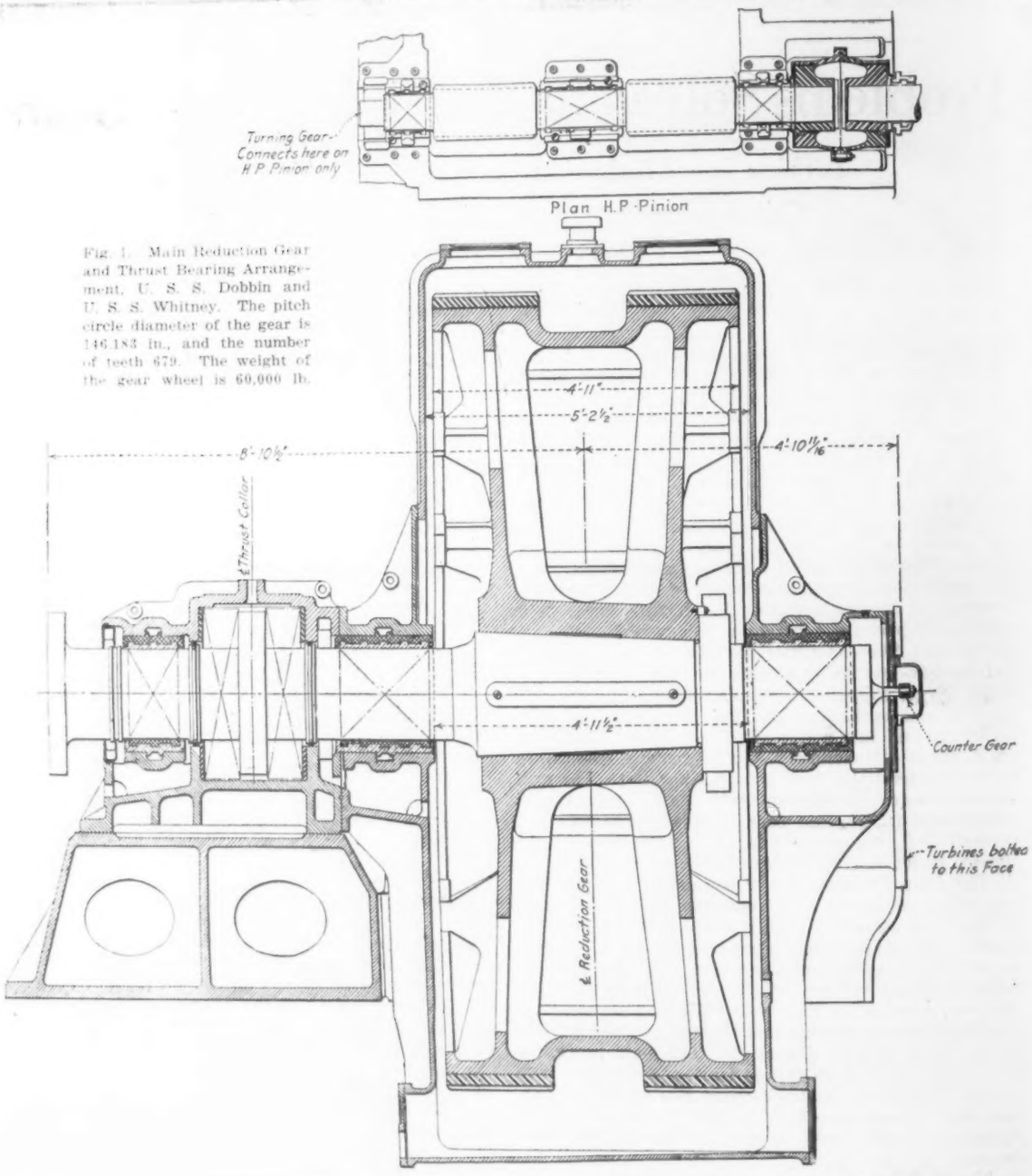


Fig. 1. Main Reduction Gear and Thrust Bearing Arrangement, U. S. S. Dobbin and U. S. S. Whitney. The pitch circle diameter of the gear is 146.183 in., and the number of teeth 679. The weight of the gear wheel is 60,000 lb.

Gear Cutting Machine Carefully Checked

The machines for cutting the teeth in the gear wheel and pinions were provided by the Navy Department, and were obtained from the Parsons Marine Steam Turbine Co., Ltd., Wallsend on Tyne, England, but certain parts were manufactured by William Muir & Co., Manchester, England. These machines are equipped with what is known as a "creeping gear," developed by Sir Charles A. Parsons. His paper, "Mechanical Gearing for the Propulsion of Ships," presented before the

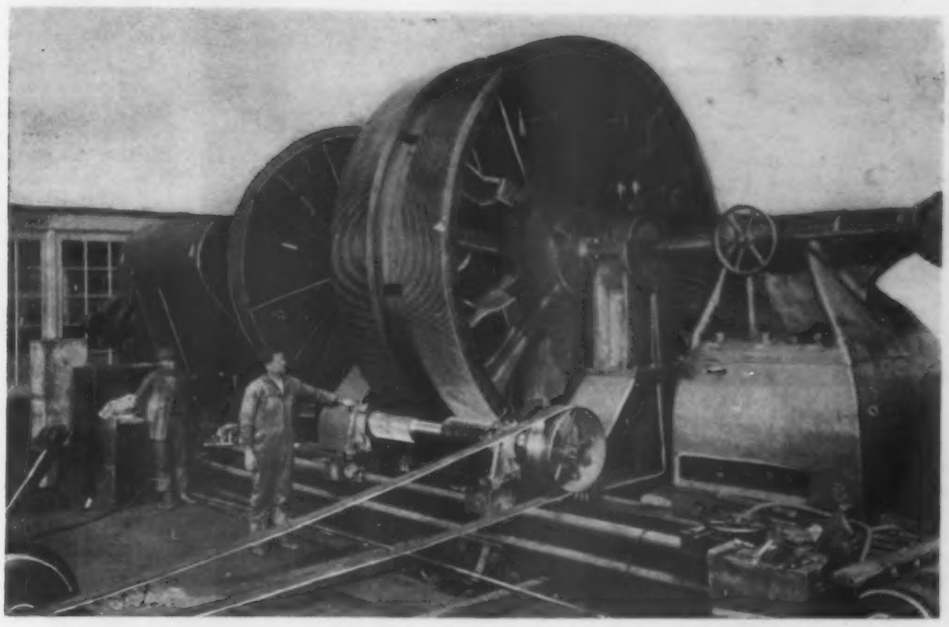


Fig. 2. The Assembled Gear Was Set Up in the Lathe, the Shaft Being Supported by Special Steady Bearings as Shown. The "supporting feet" were machined and the blank turned to the proper outside diameter. After the teeth had been cut, the gear was assembled on its shaft and the gear and pinion mounted in the lathe shown, for checking. The motor was located on the floor and belted to the pinion

Institution of Naval Architects on March 13, 1913, describes the principle of the creeping gear in part as follows:

> "In the process ordinarily adopted, in which the work is mounted on a table rotated by means of a worm and worm wheel, the latter being attached permanently to the table, the errors will be some function of the angular position of the work, and, therefore, lie in planes through the axis of rotation; and if, as is mostly the case, the errors of the parent gear are periodic, these planes will lie at equal angular intervals, and will come into mesh periodically. Now, it will be seen that, if the work is given a small steady advance in relation to the table, the errors instead of lying in planes through the axis, will lie in spirals around the wheel, and that when put to work they will be obliterated and leave a true wheel."

The "creeping gear" supplies the means for imparting a small movement of the work relative to the master worm wheel.

Previous to assembling the machines, the general arrangement of which may be noted from Figs. 3, 4 and 6, the various parts were checked because it was appreciated that the teeth of the finished gear must be correct as to shape and pitch to within very small tolerances. Moreover, the helical angle must be accurately cut in order to obtain contact along the whole length of the face of the gears. These machines had been shipped across the Atlantic and they had been built under the stress of war work, so that careful checking was deemed desirable and various adjustments were made. One of these adjustments consisted in turning the vertical spindle of the table of the large gear cutter and fitting the bearing around it with very small clearance in order that the cutter would not cause the displacement of the center of rotation of the gear from its designed center. The operation of the machine experimentally indicated that it was desirable to carry a considerable portion of the table load on the ball bearing at the bottom of the table spindle. Therefore a bearing of heavier construction was installed, due to the

Fig. 3. The Machine for Cutting the Gear Teeth Was Inclosed in an Electrically Heated Room to Keep Temperature Conditions Constant. Various parts of the machine were checked and several adjustments made. A heavier table spindle ball bearing was installed, and steady rests placed around the table at intervals of 120 deg. A new cutter spindle was made. After the blank was placed on the table it was checked carefully for eccentricity

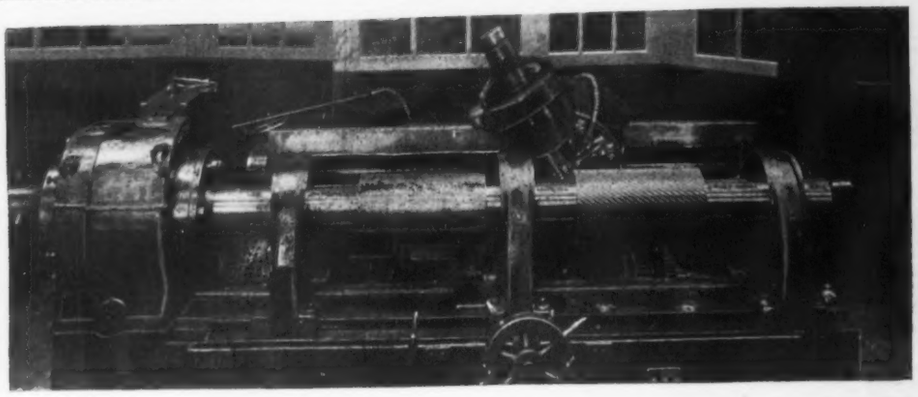


Fig. 6. Machine Used for Cutting Teeth of the Pinion. It was unnecessary to inclose the pinion cutter because the time for cutting the teeth was only one day

fact that the gears to be cut were somewhat larger than the machine was originally designed to cut. Steady rests were installed around the table at intervals of 120 deg., one of these being shown in Fig. 3.

These modifications gave a smoothly operating table with no displacements of its center of rotation. A new spindle for the cutter was made and the bearings fitted accurately to it so that it required some little effort to rotate the shaft in its bearings. Adequate provision for lubrication, however, was made. The reason for this arrangement was to avoid any chatter by the hob in the shaft bearings. A balance wheel was added to the end of the hob shaft also, on account of its inertia effect, and this in turn was steadied by a friction band.

From Fig. 3 it will be noted that pads are secured to the table. These pads were faced off by means of a tool mounted on the tool post of the gear cutter, thus assuring accuracy of the facing in relation to the center of rotation of the table. The outside diameter of these pads corresponded to the inside diameter of the "supporting feet" of the gear blank. After the gear blank had been placed on the table it was checked for eccentricity by means of a dial gage while the table was rotating and relocated as necessary, until the variations in the dial gage were at a minimum. The blank was then secured and preparations for cutting operations made.

The setting of the angle for the cutter spindle was done by means of a device shown in Fig. 5. This device is a very sensitive spirit level, and as previously stated it was essential that the angle at which the teeth were to be cut in the gear and pinion should be very accurately determined in order to insure contact throughout the full length of the face of the teeth.

Provision Made for Continuous Power Supply and Constant Temperature

Power for the machine was supplied from the yard power station, the voltage of which varies somewhat due to the variable demands for power. To guard against a possibility of loss of power which would result in the stopping of the machine, a number of electric storage batteries from the yard supply department were installed to operate the machine over a period of several hours. These batteries were arranged so that some could be charged while others were on the line. It was found that this arrangement gave uniform voltage to the motors of the machines, which resulted in uniform number of revolutions per minute. The transfer from the power system to the storage batteries was automatic.

Another factor which was given considerable thought was the possibility of temperature changes, and their effect on the accuracy of the gear cutting. It was decided to inclose the gear cutter and install electric heaters so that constant temperature conditions could be maintained during cutting operations. Experience in cutting the test gear blank indicated also that it was desirable to maintain the cut constant after it had been started, particularly the finishing cut, due to the fact that there are certain strains in the machine

Fig. 4. The Cut Was Maintained Constant, the Time for One Cut Being Approximately Nine Days, 24 Hr. a Day (at Right)

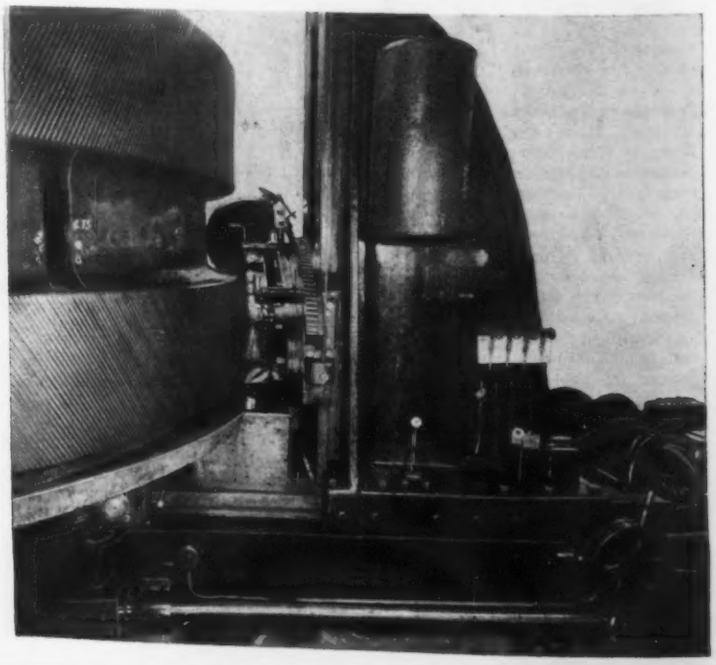


Fig. 5. Device Used for Setting of Angle for Cutter Spindle (Above)

which will remain constant so long as the cutting is continued. The room inclosing the gear cutting machine is partly shown in Fig. 3. It was not considered essential to inclose the pinion cutter, which is shown in Fig. 6, because the time required to hob a pinion is only about one day.

Quadruple-thread hobs were used for cutting teeth in the gear, and single-thread hobs for the pinions. For both the gear and the pinion two hobs were used, one for roughing and the other for finishing. The roughing hob was set to within 0.01 in. of the designed tooth depth, which depth was selected after several experiments proved it to be the most satisfactory. It was also found that the revolutions of the cutter at 14 per min. gave the most satisfactory results. Another reason for selecting this depth of cut for the roughing blank the accuracy was checked by moving the loose ring around the base ring and noting the alinement of the teeth. Eight points equally spaced were made on the two rings numbered from zero to 7. One method of measuring, the data from which are shown in Fig. 7, was to move the loose ring so that each position registered with the zero position of the base ring and the variations in alinement of the teeth were noted and recorded for each position. The other method was to move the zero position of the loose ring successively to the positions of the base ring and the variations in alinement of the teeth were noted and recorded for each position. This test was considered to be very severe. In considering these data due allowance should be made for a possible small eccentricity in setting the base ring on the table of the gear cutter, and also

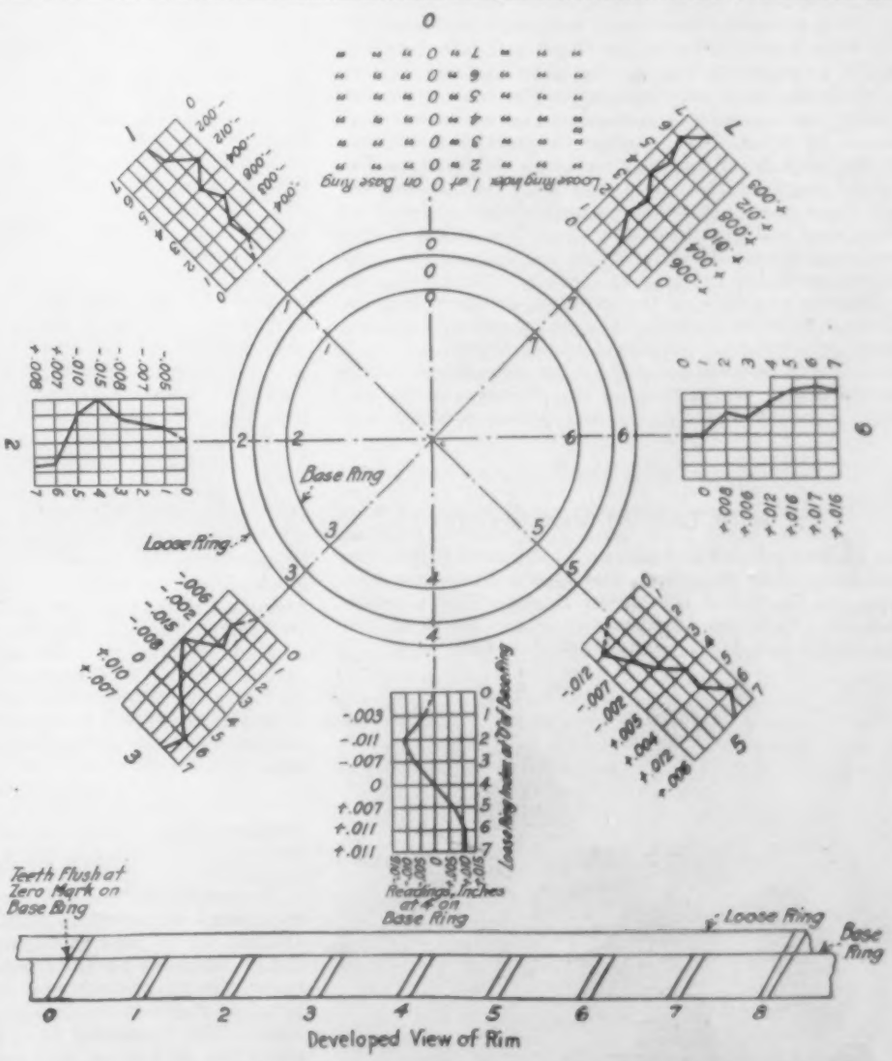


Fig. 7. Reduction Gear Diagram Showing Variation of Tooth Positions in Trial Blank. Readings were taken at eight equidistant points around the circumference, with the several points on the loose ring located successively at zero on the base ring. Other readings (not shown) were taken, with zero on the loose ring located at several points on the base ring

cutter was to have it operate as near the pitch circle conditions as possible in order to insure accurate spacing of the gear teeth. The time required to make one cut was approximately nine days, 24-hr. a day.

Accuracy of Gear Cutting Operation Tested

When the arrangements outlined above were completed, the accuracy of the work the machine would do was checked. For this purpose cast iron rings were used, one ring being centered on the other, but secured together. In order to give the machine a load equivalent to the actual cutting of the gears, the gear blank of the Dobbin was placed on top of the cast iron rings. This arrangement gave the additional advantage of wearing the bearings of the machine smooth before actual work was done.

After the cutting of the cast iron experimental some small eccentricity between the loose and the base ring. In Fig. 7 the readings recorded on position No. 4 vary from minus to plus through zero, which indicates the presence of some eccentricity. The variations, it should be noted, are double the actual error. Furthermore, these readings were taken in a plane at right angles to the axis of the blank, and, as stated in an earlier paragraph, the purpose of the "creeping gear" of the gear cutting machine is to prevent these variations being repeated along the gear face in an axial plane, and to distribute the variations in spirals around the gear.

The data were referred to the Parsons Marine Steam Turbine Co., Ltd., for opinion as to whether or not the work accomplished by the machine was as accurate as anticipated. The company's reply indicated that the accuracy of the work was comparable with the

best English practice. The results shown represent the accuracy obtainable with a machine built in 1917, but progressive improvements in the art of gear cutting permit of even a greater degree of accuracy at the present day.

The machining of the pinions presented no special problems other than those already outlined. The teeth of the gear were cut first in the lower face, after which the gear was turned over, and then in the other face.

Finished Gear and Pinion Given Running Test

After the cutting of the gear it was assembled on its shaft and the gear and pinion placed in the lathe shown in Fig. 2 for checking. The distance between the centers of the gear and pinion was in accordance with the designed dimension. Care was necessary in placing the pinion in position because it is a relatively simple matter to get the pinion either one tooth ahead or one tooth behind its correct position. The motor of the lathe was located on the floor and belted to the pinion, as shown in Fig. 2. The only lubricant applied to the gear teeth was kerosene. The bearing of the gear teeth was noted and the few high spots were removed by filing. The bearing throughout the length of the tooth faces was very uniform. At this time the proper length of the pinion gear faces was determined and later machined to the proper length, the ends chamfered and thinned at the ends. The object of this was to eliminate breaking off of the ends of the teeth during operation and causing trouble in the gears.

During assembly of the gears in the gear case the distance between centers of the pinion and the gear was made accurately to correspond to the dimensions specified. Fixtures were secured to the gear wheel, which extended over the journals of the pinions, and the distance between the fixtures and pinion journals was measured. These data were transmitted to those who made the installation in the ship in order to aline the gear case correctly, before it was secured to its foundations. The method was devised by master machinist Richard F. Cantwell. These fixtures are fitted with dowels in order that they can be reinstalled at any time for checking the alinement of the pinions.

Operation Satisfactory

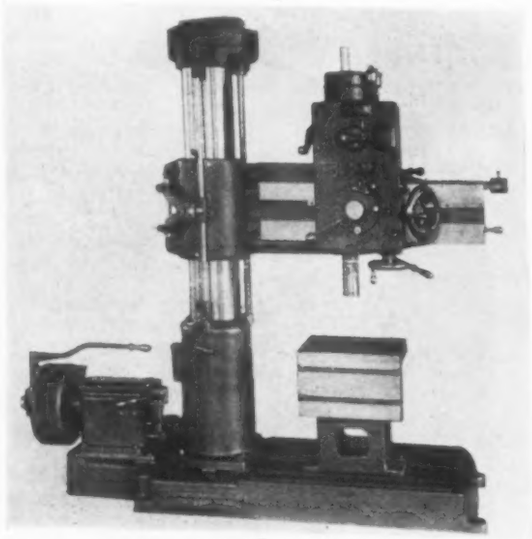
The gears installed in the Medusa were cut as outlined in this article and the reports indicate very satisfactory operation. The gears have also been installed in the Dobbin and Whitney. The Dobbin has been tested by the Board of Inspection and Survey over the measured mile course, and also the several endurance tests required by that board. The reports of the gears indicate that the noise produced is a low hum, not at all objectionable, that the alinement is satisfactory and that the lubricating system is adequate for all powers. The ship was designed to maintain a speed of 16 knots at 105 revolutions of the propeller and 7000 shaft horsepower. The trial indicated a speed of 16.22 knots, revolutions 107.9, shaft horsepower 7120, and the trial displacement was about 10,900 tons.

The Whitney has been subjected to a builder's trial, the maximum revolutions of the propeller being about 102. The reports indicate that the gears are operating satisfactorily. The gears for the Holland have recently been completed and shipped to the Puget Sound Navy Yard.

The successful completion of this work is largely due to the care and foresight of master machinist George J. Costello, who had charge of the work in the machine shop. The writer is indebted to Ernest H. B. Anderson, Parsons Marine Steam Turbine Co., Ltd., New York, for suggestions in preparing this article.

Adds to Line of Radial Drills

High-speed radial drills in 2-, 2½- and 3-ft. sizes, and heavy-duty units in 3- and 3½-ft. sizes, have been added to the line of the Morris Machine Tool Co., Cincinnati. Eighteen spindle speeds are available, the maximum speed of the high-speed radials being 900 r.p.m., and of the heavy-duty machines, 650 r.p.m. Six feeds are provided.



The Speed Box Is of Sliding Gear Type and Is Equipped with Ball Bearings

The speed box is of the sliding gear type and is equipped with ball bearings. The spindle is fitted with ball thrust bearings and the spindle gear is ball bearing mounted. The spindle gears are of alloy steel, heat-treated, and are of helical type. The spindle sleeve is of steel, has a rack cut directly in it, and is fitted with a bronze bearing. The tapping attachment and back gear bracket is a unit mounted on the back of the head, the tapping attachment running in oil. Multiple disk type frictions are provided in the tapping attachment, quick adjustment being obtained from the outside of the casing. The head is fully inclosed. One lever operates two clamp screws, clamping the head on the arm without affecting the alinement. Oil is distributed throughout the head from a reservoir at the top, the oil cup being filled once a day, and the feed worm is arranged to dip in a trough of oil. The column cap is equipped with an oil reservoir with leads to all bearings.

Engineering, Shipping and Machinery Exhibition in London

In connection with the American section of the International Engineering, Shipping and Machinery Exhibition, to be held at Olympia, London, Nov. 23 to Dec. 5, 1925, an advisory committee has been formed under the chairmanship of F. D. Herbert, president Kearfott Engineering Co., Inc., 95 Liberty Street, New York. This committee is to cooperate with a similar committee in London, and a special list of American patrons has been secured. F. W. Bridges, general manager and organizer of the exhibition, has been in the United States for several weeks, visiting industrial centers and interviewing manufacturers, exporters, shipowners and others connected with the various industries concerned.

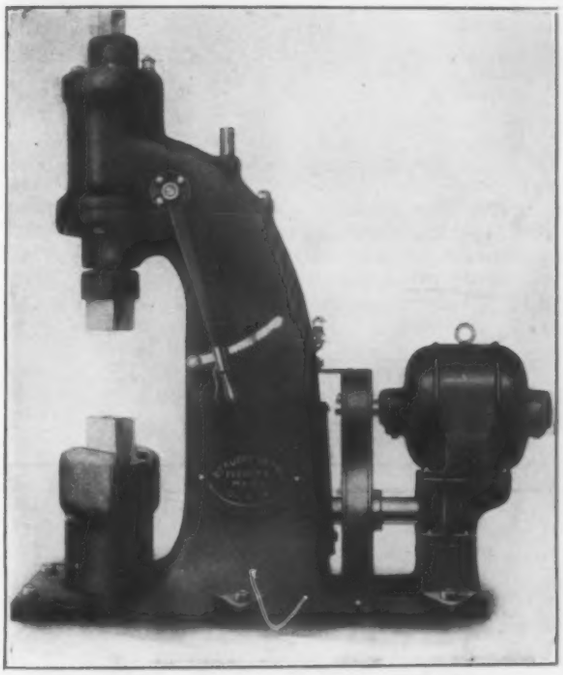
One object of the exhibition is to bring facts of American facilities for manufacture and transportation before the commercial and shipping world and to introduce American manufactures adapted to shipyard work, ship equipment and general engineering purposes.

The Ohio Seamless Tube Co., Shelby, Ohio, manufacturing cold-drawn seamless steel tubes, has placed a contract with the Standard Engineering Co., Ellwood City, Pa., for additional equipment and for alterations of present equipment. Capacity will be considerably increased and the plant modernized by the changes and additions to the equipment.

New Upright Air Hammers

Air hammers in six sizes, with rams ranging from 100 to 1200 lb. and arranged as shown in the accompanying illustration, have been placed on the market by the Beaudry Co., Inc., Everett, Mass. The machines may be furnished for either belt or motor drive, and all sizes are equipped with foot treadles and hand levers for operation either by foot or hand.

The blow is regulated from a light sensitive tap to a heavy blow by means of the foot treadle, the ram being held suspended when not working or when clamping the work for bending. Bars of any length may be worked either way of the dies. Anvils are separate and are supported upon their own foundations to eliminate shocks to the hammer frame. Lubrication is automatic. When equipped for belt drive the use of a countershaft is unnecessary.



The Blow Is Regulated, From a Light Tap to Heavy Blow, by Means of a Foot Treadle

The ram is of a form in which the greater part of the weight is concentrated in a bar of large section, and is guided by passing through both the upper and lower cylinder heads. This is stressed as permitting a greater amount of room for handling the work than is possible if the ramhead were guided by the frame only. The head is separate from the bar and may be removed conveniently when it is required to remove the ram from the cylinder. It is held to the ram securely by a wedge clamping ring. The cushioning of the ram is by means of air. In operation, the compressor piston in ascending compresses the air above it, the air flowing into the ram cylinder, sending the ram upward at high speed. When near the top, the air is trapped, forming a cushion, which causes the ram to rebound, and this combined with the suction of the descending compressor piston causes the ram to strike the work with force.

The average size of work ranges from 2½ to 8 in., and the blows range from 220 to 110 per min. on the smallest and largest machine, respectively. The weight of the smallest unit is approximately 5000 lb. and the weight of the largest, 34,000 lb.

Members of the Electric Hoist Manufacturers Association report an increase of 27.54 per cent in the number of hoists sold in December as compared with November and an increase of 15.62 per cent in the value of hoists ordered. Shipments increased 41 per cent in December as compared with shipments made in November.

John Fritz Gold Medal Awarded to John F. Stevens

The twenty-first award of the John Fritz gold medal was made Jan. 16 to John Frank Stevens, New York, for achievements as a civil engineer, particularly in planning and organizing for the construction of the Panama Canal; as a builder of railroads, and as administrator of the Chinese Eastern Railway. The award was made by a board of 16 representatives of the American societies of civil, mining and metallurgical, mechanical and electrical engineers.

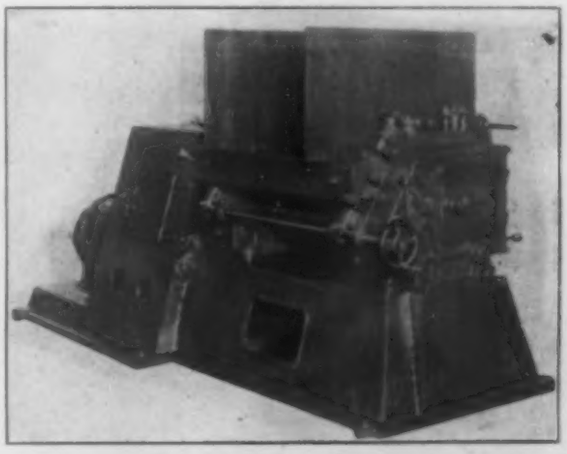
As head of the American railroad mission to Russia, 1917-1918, Mr. Stevens contributed to the success of the allied nations in the great war. He was also director of a corps of railroad experts in Manchuria. From 1919 to 1923 he was president of the interallied technical board supervising the Siberian Railroads. While holding this office, with headquarters at Harbin, Manchuria, he supervised the technical and economic operation of the Siberian and Chinese Eastern Railroad.

From 1905 to 1907 Mr. Stevens was chief engineer of the Panama Canal, and in 1907 acted as director of the Isthmian Canal Commission. At various times in earlier periods of his life Mr. Stevens was chief engineer, vice-president or manager of the Great Northern Railway, the Chicago, Rock Island & Pacific Railway, the New York, New Haven & Hartford, and president, successively, of the Spokane, Portland & Seattle, the Oregon Electric and other western railroads. He was born at West Gardiner, Me., April 25, 1853.

Heavy-Duty Strip Coiling Machine

A heavy-duty coiling machine recently built by the Dailey Machine Construction Co., Cleveland, for the hot strip mill plant of the Otis Steel Co., is shown in the accompanying illustration. Heavy and rigid construction is a feature.

The machine is designed for cold coiling of hot rolled strip steel up to ¼ in. in thickness and 30 in. wide, and also for coiling cold rolled strip steel. The three bending rolls and the two siding or pinch rolls are of large size, being 6 in. in diameter and having a face of 30 in. The side plates are self-supporting and are carried in notched cross members permitting adjustment for strips up to 30 in. wide. All of the gears are made of steel and operate in inclosed cases. The stud gears have outboard bearings. All bearings are bronze bushed. The bed plate is of box-type construction and in its general design the coiler is compact and low. The drive is by means of a 15 or 20-hp. motor, which is mounted on the end of the bed plate. The machine occupies a floor space of 8 x 4 ft. and weighs 9000 lb.



Hot Rolled Strip Steel Up to ¼ In. Thick and 30 In. Wide May Be Coiled Cold

Pioneer Pipe Producer Re-Enters Market

Mark Plant Has Capacity of 80,000 Tons of Black and Galvanized Butt-Weld Pipe Per Year—Well Points and Water Well Supplies Also Manufactured

BY GILBERT L. LACHER

CLAYTON MARK & CO., Chicago, was organized early in 1924 by Clayton and Anson Mark and associates. Pioneers of the pipe industry in the West, the Marks are re-entering a field which they temporarily left after having built up a large company which, until recently, was the only manufacturer of tubular steel products in the Chicago district.

In 1888 the Mark Mfg. Co. started business at Chicago in the manufacture of water well supplies. In April, 1901, the company moved to a new plant at Evanston, Ill., and added to its activities the production of wrought steel pipe. Of the manufacturers of steel pipe in existence at that time, only one other organization outside of the National Tube Co. is still in business. Hence the Marks are among the oldest figures in the steel pipe industry, not only in the West, but in the country at large. With the Evanston plant as a nucleus, the Mark Mfg. Co. expanded its operations and, after the construction of a large steel works, pipe mills, a blast furnace and by-products coke ovens at Indiana Harbor, Ind., changed its corporate style to the Steel & Tube Co. of America. Clayton Mark was chairman of the board of directors of that organization at the time of its purchase by the Youngstown Sheet & Tube Co. in 1923. The name of Mark has long been associated with pipe in the West and the recent completion of a mill by Clayton Mark & Co. will bring it again to the attention of the trade.

War-Built Ordnance Plant Utilized

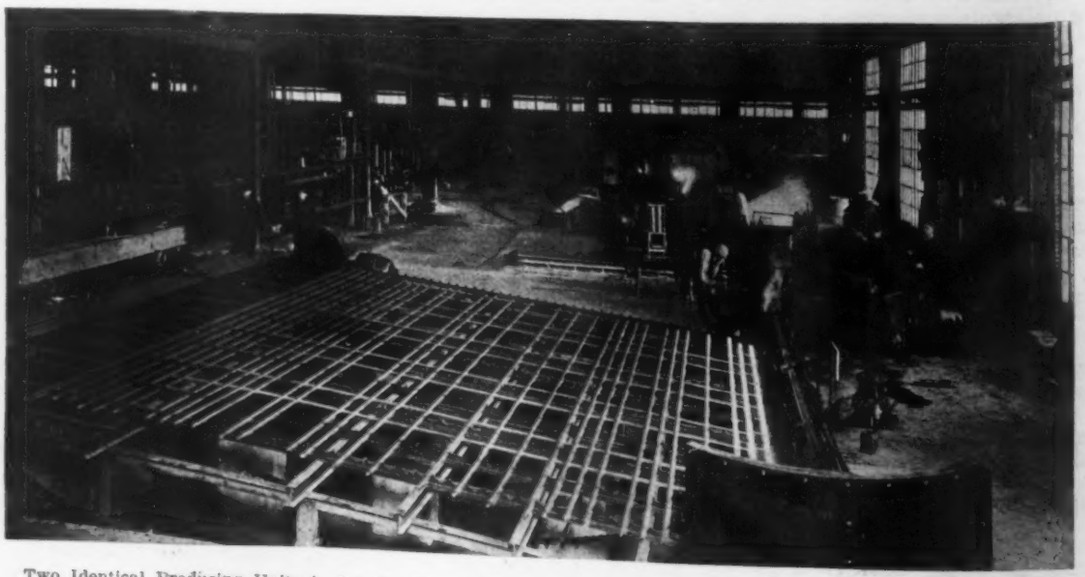
In casting about for a suitable plant location the new company found buildings which with little alteration lent themselves admirably to its purposes. Consequently the time which would have been consumed in grading, erection work and the laying of railroad sidings was saved, and it was only necessary to make minor changes in the original layout and to install equipment. Built originally for the Government ordnance department during the war, the structures are located at West Seventy-fourth and South Robey Streets, Chicago, in a part of the city where a good labor supply is close at hand. With framework of structural steel and exterior of tile and brick, they are of substantial construction. Excellent natural illumination is provided by continuous sash in monitors and ample window space in the side walls. An east building, 150 x 506 ft., consisting of three main parallel bays, houses the pipe-producing equipment. A west structure, 168 x 368 ft., is utilized for offices, enameling ovens and an electro-galvanizing plant for conduit manufacture, and a specialty department in which drive well points and water well supplies are made. The plant site embraces 28 acres, and a large area of vacant adjoining land insures room for future expansion.

For skelp storage a stock yard, 60 x 400 ft., was built and equipped with a 5-ton Milwaukee Electric Crane & Mfg. Co. overhead electric traveling crane. To supply fuel for the furnaces two 10-ft. gas producers were erected by the Morgan Construction Co., Worcester, Mass. A 440-hp. boiler was also installed.

A track extends directly from the stock yard into the raw material end of the mill, which is served by a 10-ton Milwaukee overhead electric traveling crane which operates at right angles to the welding furnace bays. The crane is utilized to transfer bundles of skelp from cars to inclined skid beds serving the furnace charging machines.

Duplicate Producing Units Installed

There are two identical producing units in parallel bays, with a combined estimated annual output of 80,000 tons in butt-weld pipe up to 4 in. in diameter. The hearths of the welding furnace chambers are 8½ x 23 ft. The furnaces are fired with producer gas. The draw benches, like the charging machines, are motor-



Two Identical Producing Units in Parallel Bays Have a Combined Annual Output Estimated at 80,000 Tons of Butt-Weld Pipe up to 4 In. in Diameter. From the draw bench shown in the background pipe is passed over skid rods attached to the side of the bench to a roll table which delivers the steel to a sizing roll. After sizing, the pipe passes over the inclined cooling rack shown in the foreground

In the Finishing Department the Pipe Passes through Cutting Off and Threading Machine, after which It Is Subjected to a Hydrostatic Test, Bundled, Oiled and Weighed

The Coupling Department Consists of Two Identical Units, One of which Is Shown. The coupling iron is first passed through the bevel shear in the foreground, which cuts it into coupling blanks. These are heated in a gas-fired furnace, at the left, whereupon they are passed through a welding roll, in the middle background. After the coupling has been formed in the roll, an extractor—shown to the right of the roll—punches out the mandrel around which the coupling blank was rolled

Well Points Are Made from Black Pipe which Is Perforated in Two Bliss Presses. The larger press, shown in the center, which is used for the larger diameters, is equipped with a gear-driven chuck which grips the end of the pipe, turning and advancing it for the proper spacing of the perforations. Brass screen is made in the machine shown in the left foreground, which perforates rolls of sheet brass

driven and operate on tracks across the ends of the furnaces. After heated skelp has been drawn through the pipe-forming bells, the tong is removed from the end of the pipe and it is then passed over skid rods attached to the side of the bench to a roll table which delivers the steel to a sizing roll. After sizing, the pipe is passed over an inclined cooling rack, whereupon it is stacked in piling racks.

Beyond the racks in each welding furnace bay are the finishing departments, where the pipe is inspected and then passed through cutting-off and threading machines. After being subjected to a hydrostatic test, the pipe is bundled, oiled and weighed. Deliveries are made from a shipping bay, located on one side of the structure and parallel to the two furnace bays. A shipping track permits railroad cars to be spotted under cover for loading direct from the floor, which is done by 5-ton overhead electric traveling crane. Cranes of the same capacity—all built by the Milwaukee Electric Crane & Mfg. Co.—serve the two production bays. Transfers from the finishing departments to the shipping floor are made by industrial truck.

The welding furnaces were built by the company and all the furnace equipment was supplied by the United Engineering & Foundry Co., Pittsburgh. The threading and cutting-off machines were built by the Taylor-Wilson Mfg. Co., McKees Rocks, Pa.; an hydraulic pump by Dean Brothers Steam Pump Works, Indianapolis, and four hydrostatic testing machines by the Hadfield-Penfield Steel Co., Bucyrus, Ohio.

Galvanizing Department with Two Pots

Located in a bay extending across the finishing end of the mill is a galvanizing department equipped with two oil-fired galvanizing pots, one 12 ft. and the other 26 ft. long. Another department, located at the raw material end of the structure, is that devoted to the manufacture of couplings. Coupling iron is fed into a bevel shear and cut into coupling blanks, which are heated in a gas-fired furnace and then passed through a welding roll. After the coupling has been formed in the roll an extractor punches out the mandrel around which the coupling blank was rolled. There are two identical coupling departments, each consisting of a bevel shear, a furnace, a welding roll and an extractor. The equipment was supplied by the United Engineering & Foundry Co.

Electric current is bought from the Commonwealth Edison Co., Chicago, at 12,000 volts and stepped down by transformers to 440 volts a.c. A motor-generator set furnishes 220-volt d.c. for the cranes, threading machines and other equipment.

A large bay in the west building is occupied by a conduit department. Two continuous oil-fired ovens are used to enamel the conduit. Facilities for electro-galvanizing have also been provided. A loading track and platform on one side of the building facilitates the handling of shipments.

Special Well Equipment Produced

An outlet for part of the mill's output has been supplied by a specialty department located in the west building, which measures 168 x 368 ft., not including a brass foundry, 20 x 60 ft. The principal output is in drive well points and various water well supplies, consisting of artesian, tubular and deep well cylinders, strainers, wood and iron rod couplings, pump leathers, etc. Cylinder and valve parts are cast in the brass foundry, which is equipped with a gas furnace. The valves, incidentally, are cast from bronze because that metal is not brittle like brass.

Well points are made from black pipe which is perforated in two Bliss presses. The larger press, which is used for the larger diameters, is equipped with a gear-driven chuck which grips the end of the pipe, turning and advancing it for the proper spacing of the perforations. For the longitudinal movement of the pipe the chuck is located on a carriage. A double cutting off and threading machine has been provided for cutting and threading the pipe.

Two types of well points are made, those wrapped with bronze cloth or perforated brass, called jacket points, and those fitted with washer screens. The perforated brass is made in a Bliss machine which perforates rolls of sheet brass. The washer type points are made by countersinking the holes in the pipe, inserting small pieces of screen cloth and then riveting the pipe over the screens.

The pipe is galvanized after it is perforated and before it is fitted with screens. The points of the well points are malleable castings. The collar of the point is ground to fit snugly the inside of the pipe end. Once properly fitted, the pipe and the collar are drilled through and riveted. The point is then given a coat of black paint to protect it from rust, and subsequently the entire well point in its finished state is wrapped in paper, labeled and stamped with gage and trade numbers.

The rest of the specialty bay is devoted to the tapping of couplings and to general machine shop work. On the opposite side of the west building are the plant offices, which occupy a space 30 x 180 ft. Continuous sash in the wall provides excellent natural illumination. Adjoining the offices is a well-appointed lavatory and toilet room.

Direct connections with the Belt Railway of Chicago and the Pennsylvania Railroad make the Mark plant well located for rail transportation.

Standards for Invoice, Purchase Orders and Inquiry Adopted

WASHINGTON, Jan. 20.—Problems arising from the use of mechanical equipment in buying were discussed by Frank E. Webner, of the American Society of Engineers, who also represented the Financial & Industrial Accounting Corporation of Detroit, at a meeting on Wednesday of last week at the Department of Commerce. Representatives of purchasing organizations, industrial engineers and national bodies took part in the meeting, at which standards for invoice, purchase order and inquiry forms for use in American business were adopted.

The subject discussed by Mr. Webner also was dealt with by other prominent men who have given deep study to the problem. The action of the meeting in adopting standard forms was the result of several years of effort of various interested organizations which have been cooperating with the Division of Simplified Practice, Department of Commerce. The aid of the division was sought so as to bring about the elimination of hundreds of varieties in these business documents and in securing to American business houses a saving which has been estimated at more than $15,000,000 a year.

It was voted that the standards become effective at once, or as soon as existing stocks of forms are used up by the various business houses, and that they will remain in effect until Jan. 1, 1927.

McWane Cast Iron Pipe Company's Additions

BIRMINGHAM, ALA., Jan. 19.—J. R. McWane, president McWane Cast Iron Pipe Co., states that an additional plant expansion that will double the company's output of pipe per day will be made in addition to the enlargements and betterments announced early in December. "We are simply building to keep pace with the growth of our business," said Mr. McWane. "When we started early in 1922 in a leased foundry in North Birmingham we had some idea of the field and the demand for small cast iron pressure pipe, ranging between 1½ and 6 in., but our experience since then has shown that we were more nearly right than we knew. Our product, McWane precalked joint cast iron pipe, is manufactured under approximately 20 patents covering improved methods of casting pipe, and equipping it with factory-made joints that greatly reduce the labor and cost of connecting up the pipe in the field."

Sharing Management with the Employees

Plan Which Proved Successful in Removing Causes of Friction, Meeting Problem of Low Wages and Promoting Contentment

BY MARY VAN KLEECK*

A FEW weeks ago, the Russell Sage Foundation made public a report of its study of the partnership plan of the Dutchess Bleachery, Inc., at Wappingers Falls, N. Y., which in the first three years of its operation revolutionized the attitude of the workmen toward production, transformed a village of dilapidated houses into a community of comfortable and sanitary homes, and enabled the company to pay dividends when most other companies in the same industry were suffering from a severe business depression.

Though a bleachery may not look like a blast furnace, nor a sheet mill, nor even a metal fabricating plant, human beings are employed in each; wages, dividends, and output of consumable goods flow from each; the essentials of success in human relations and the incentives which lead to action among workmen are alike in each. The experience of the Dutchess Bleachery is, therefore, significant to industry generally; but it is particularly significant to the iron and steel industries because the relation between employers and employees at this plant, and the effect of the plant on the community, when the partnership plan was conceived, are identical to present day conditions in many branches of the iron and steel and allied industries.

The Dutchess Bleachery is one of the largest mills of this kind in the country, usually employing about 600 workers, including a considerable number of Italians. The partnership plan was adopted in 1918 by new owners of the business. They had bought the plant from the family which had established it nearly 100 years before.

Causes of Unrest

Familiar causes of unrest had existed among the workers—long hours, low wages, and bad living conditions. The workers were restive and suspicious. The firm seemed to them to have no interest in them as human beings. They felt insecure in their employment. A man could be discharged by the foreman without notice, and with no explanation. As the bleachery is the chief industry in the town, discharge often forced a man to break up his home and to move his family to another community.

Back of the discontent of the workers were two large problems which confront industry generally today—insecurity of employment and the lack of any definite plan of representing the point of view of wage-earning employees when wage rates, hours of work, and other conditions in the plant are decided upon. Added to these problems was the dilapidated condition of the company-owned houses, in which most of the workers lived. They had been badly built, and considerations of economy had left them to deteriorate into unsanitary living places.

One of the new owners had been led to make an analysis of industrial organization because a friend of his had declared that no industry was run on ethical principles. His analysis led to the conclusion, in which other active directors concurred, that industry failed to satisfy the needs of its employees on three counts:

First: The managers of large operations lack personal contacts with their own employees. Without these contacts they are unable to understand the points of view of the wage-earner or to see how disadvantageous conditions affect them.

Second: Industry provides no stimulus to creative work. The worker is limited to one small job and has no information about the industry as a whole, nor can he see his share in it. The prosperity of the business seems to him to be quite independent of his own efficiency.

Third: Not only does the worker fail to see that his small task is important in total production, but he is skeptical as to whether he receives his share of the earnings of the business, and he does not feel that he has any permanent place in the business.

The partnership plan, as gradually evolved in the Dutchess Bleachery, was directed toward remedying these three defects. It aimed to give the workers a voice in the conduct of the business, to give them current information on the success of the business, and to share profits with them, besides providing funds in advance to enable the business to make payments to both stockholders and wage-earners in periods of industrial depression.

Three Boards Organized

The participation of employees in the conduct of the business is secured through three boards:

(1) The Board of Operatives: It consists entirely of employees, elected by their fellow-workers. It has entire charge of the company houses, deciding upon all requests for repairs and other details connected with their management. Provisions for recreation and for education, not only for employees but for the whole village, are under its supervision. It is also the channel for presenting to the management any grievances of individuals or of groups of workers in the bleachery.

(2) The Board of Management: This is a joint body composed equally of employees elected by the board of operatives, and stockholders chosen by the board of directors. All important questions relating to the conduct of the bleachery, such as rates of wages and hours of work, are decided by this board.

Keen Interest Shown in Report

WHEN it was announced a few weeks ago by THE IRON AGE *and other papers that the Russell Sage Foundation had completed a study of the partnership plan adopted by an important company, keenest interest was aroused and many applications have been received for information as to the details of the results of this investigation. An outline of the report is contained in this article. Copies of the document in detail may be obtained from the Russell Sage Foundation, 130 East Twenty-second Street, New York.*

Different remedies must be applied under different conditions, but underlying principles are the same and human nature is pretty much alike in all plants and all countries.

*Director Department of Industrial Studies, Russell Sage Foundation.

(3) The Board of Directors, which is elected by the stockholders, consists of representatives of the operatives, the town of Wappingers Falls, and the stockholders. It formulates the financial policies of the company.

To meet the problem of insecurity of employment, sinking funds are set aside to pay part wages when workers are idle because of industrial depression, and also to pay a return on the investment of stockholders. A direct stake in the success of the business is insured through an equal sharing of profits by stockholders and wage-earners. Finally, in accordance with the procedure of a practical business partnership, the books are open to employees and they are kept continually informed concerning the state of the business.

How the Plan Worked Out

Does this sound like too radical a change in the status of wage-earners in business? As a matter of fact, it has proved to be a sensible and practical plan for dealing with the causes of friction which are familiar to every industrial manager. The partnership plan proved to be a practical business necessity in meeting the problem of low wages in an industry which is run on a small margin of profits with keen competition. Without the partnership plan, which took the workers into the confidence of the board of directors and enabled them to understand the competitive problems of the industry, discontent among the employees would have been fed by suspicion of the policies of absentee stockholders and managers.

That the employees very quickly realized the financial problems of the board of directors was evidenced in their decisions as members of the board of managers. They suggested such methods of increasing efficiency as time clocks, foremen's conferences, and mass meetings. Together with representatives of the stockholders they elected the present manager and superintendent of the mill, and the successful conduct of the plant by these men demonstrates the good judgment of the employees, for it was their representatives who actually suggested the new executives. The whole tenor of their participation has been not "How much can we get out of the bleachery for ourselves?" but "What can we do to make this a successful and efficient business enterprise for everyone concerned?"

Attitude Toward Production Revolutionized

It is the testimony of foremen and managers that the partnership plan has revolutionized the attitude of the operatives toward production. To cut down waste, to make certain that no goods were spoiled, to increase the output in a given time, insured an increase in profits and a larger net income to each operative. Here was an incentive, direct and personal, such as only proprietors of a business have heretofore experienced.

The Dutchess Bleachery experience has revealed the practicability of better cooperation between stockholders, directors, and wage-earners. The stockholders took the initiative in laying the foundation of the plan, in limiting their own profits to a given percentage and dividing the surplus, and in extending more and more power to the workers as their capacity for it was demonstrated step by step. The wage-earners have shown a growing ability to participate in the management of the plant with intelligence and responsibility, and to work out a program for community welfare.

Steel Treaters Hold Sixth Sectional Meeting

Gears, Corrosion Resisting Steels and Wear Testing Discussed at Cincinnati—High Tensile Results from Low-Carbon Steels

THE winter sectional meeting of the American Society for Steel Treating was held at Hotel Sinton, Cincinnati, Jan. 15 and 16. This was the sixth meeting of this character conducted by the society. As customary, the first day was devoted to technical sessions and the second to plant visitations. The midwinter meeting of the board of directors of the society was also held at which all directors were present. Satisfactory reports as to the progress of the society, both financially and in membership activities, were presented.

The technical meetings were well attended, particularly by members of chapters throughout the Middle West, with a scattering of representatives from along the Atlantic seaboard. The papers read were noteworthy and, while the discussions were not lengthy, a great deal of valuable information was brought out.

Gearing and Power Transmission

The morning session on Thursday was opened by an address of welcome by Dr. J. Culver Hartzell, chairman of the Cincinnati chapter, who turned the meeting over to A. W. H. Green, metallurgist the Illingsworth Steel Co., Philadelphia. At this session only one paper was presented. It was read by O. N. Stone, assistant chief engineer Van Dorn & Dutton Co., Cleveland, who discussed "Gearing as a Medium of Industrial Power Transmission." The paper was confined to gears for industrial use. Four uses were outlined: To transmit power; to change speeds; to change direction of rotation of any particular part, and to change the point of application of the power which is being transmitted.

Certain fundamental considerations of design must be taken into account to produce satisfactory gears, said the author. The principal requirements are that gears must be of uniform section and have a tooth form that will most readily meet requirements as to fiber stresses and loading. The method of mounting gears is important. Shafts should be stiff, mountings rigid and bearings as close to the center of the load application as possible.

In the selection of proper materials it is necessary to carefully analyze the application of the load to the gear and determine whether duty is to be continuous or intermittent. Also it is important to consider wear on gear teeth. The speaker said that in some cases cast iron is a better material for gears than cast steel. This depends on the question whether or not the desired strength can be obtained without taking into account the weight. A good gear iron has a total carbon content of 3.00 per cent with silicon 2.50 to 2.75 per cent. Such castings will be about 35 hard by scleroscope reading. Iron with about 15 to 20 per cent steel has also been found to result in a very good gear casting.

Gears of Forged Steel

The field of the forged steel gear blanks is increasing steadily and a large percentage of gear users are now specifying forged steel. The principal reason for this preference is economy. The forging of gear blanks is a problem having many considerations. Temperatures at the beginning and end of operations should be held within well-defined limits, according to the forging temperatures of steels being used. As a general rule flow lines of metal in forgings should be at right angles to the forces applied to the gear teeth while in operation. In the case of alloy and high-carbon steels, gear blanks should be normalized and cooled very slowly.

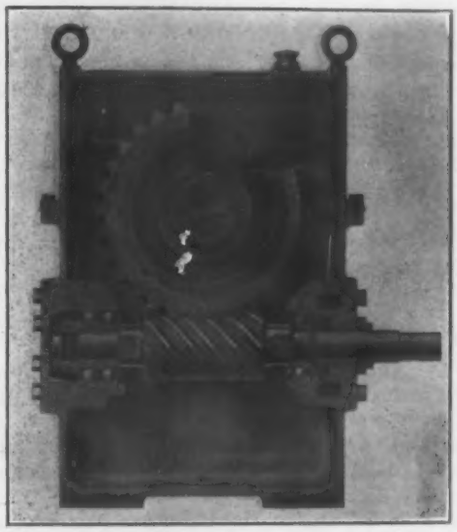
The heat treater is gradually realizing that low temperature carburizing gives as efficient results as high temperature carburizing, continued the author, and that

(*Continued on page* 313)

New Line of Worm Gear Speed Reducers

A line of worm gear reductions for use with motors and turbines driving machine tools, tumbling barrels, fans, stokers, elevators, conveyors, and other machinery, has been placed on the market by the De Laval Steam Turbine Co., Trenton, N. J.

The gearing is claimed to differ from ordinary worm gearing in the tooth shape used, materials employed, treatment of the materials and in the manufacturing methods and shop control. The tooth shape is said to combine a minimum of sliding and maximum



Section of Worm Gear Reduction in Plane of the Worm Axis. Three or more teeth are always in contact

of rolling action between the worm and the gear, and at the same time to provide continuously the greatest area of contact. Undercutting of the teeth has been avoided, the included angle of the tooth being approximately 60 deg. It is pointed out that as the pressure line normal to the face of the tooth at the pitch circle falls within the base of the tooth, failure can take place only by crushing, rather than by bending.

In the worm gear illustrated three or more teeth are always in contact, which is emphasized as giving unusually high load capacity for the size and weight, adapting the gear for heavy-duty service. Smooth flow of power is said to eliminate vibration and noise and to improve the quality of the work done by the driven machine. It prolongs the life of the connected machinery, especially of gearing and bearings. The smooth flow of power permits of speeding up the driven machinery, increasing the output.

The reduction is inclosed in a casing which is split horizontally in the plane of the center line of the wheel shaft. The lower half of the casing is supported by four feet, which permit air to circulate beneath the casing, providing additional radiating surface. The wheel shaft is carried on split plain bronze bearings, which may be removed without disturbing the wheel shaft or the couplings. Side thrust of the wheel is carried by a hardened, ground and polished steel plate, which bears against the bronze face of the wheel shaft bearing. The worm, which may be located either above or below the wheel, is mounted on ball bearings, as shown, the one at the rear of the worm being of the double type and designed to carry the combined radial and thrust load, regardless of the direction of rotation of the worm. The inner races are pressed on the shaft and the outer races are clamped both radially and axially, adjusting and locating the worm in the case. The bearing at the forward end of the worm is of the radial type, with its inner race pressed on the worm shaft. The outer race has clearance axially, permitting the bearing to adjust itself to the linear expansion of the shaft. This outer race creeps slowly, which distributes the wear over the raceway. The bearings are carried in separate housings so that the case itself is not subject to wear. The worm and wheel and the bearings are lubricated by a splash system, the oil thrown from the gearing being caught in troughs cast on the casing walls and led to the bearings.

The worm is made from a low carbon alloy steel forging which is carburized and heat treated after the threads are cut. The worms are finally ground. The worm wheels are of phosphor bronze and the teeth are generated by means of hobs, the gear wheel being mounted on its own shaft and hobbed in its own bearings.

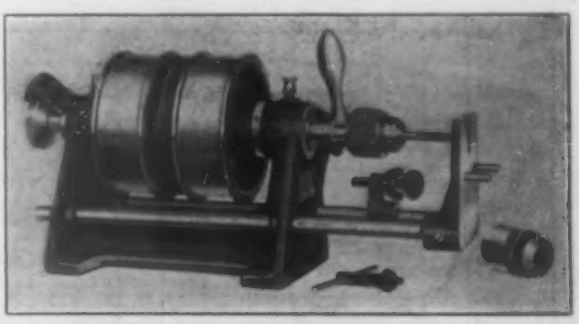
The worm reduction gears are made for transmission ratios ranging from approximately 4 to 1 up to 100 to 1 in one step, and for higher ratios with double reductions. The wheel shaft may be extended to the right or left in both directions, and frames arranged for vertical shaft drive are available. Flexible couplings of the pin and rubber bushing type are used to connect the worm shaft to the driving machine and the worm wheel shaft to the driven machine.

Bench Tapping Machines

A new bench tapping machine in two sizes has been placed on the market by the Bench Machine Tool Co., 220 North Thirteenth Street, Philadelphia, the No. 2 machine being shown in the accompanying illustration. The unit shown is of the friction cone type, and has a range from 3/16 in. to ⅝ in. in cast iron and to 5/16 in. in steel. Tapping speeds of 350 to 1000 r.p.m. are obtainable and the speed of reversal is twice that of tapping.

The sliding face-plate is finished square with the tapping spindle and an adjustable stop provided. The stop disengages the driving cone automatically when the proper depth of tapping has been reached, this being a feature of particular advantage when tapping blind holes. The machine is equipped with flanged clutch pulleys driven by one straight and one crossed belt from shafts located overhead or below. A countershaft is not employed; a stop device holds the spindle stationary when changing taps or when the machine is not in use.

In operating the machine the drilled work is placed against the face-plate, and started on the tap with a light push. When the proper depth is reached, the drive is disengaged automatically, and a slight pull starts the tap reversing. The spindle of the machine



An Adapter May Be Furnished for Threading. The machine may be used also for drilling small parts

is ground and runs in long bronze bushings. Jacobs chucks of ⅝ in. capacity are part of the regular equipment. An adapter and a Greenfield Acorn die may be furnished for the threading and by adding a small holding fixture to the face-plate, studs and similar work may be threaded. The adapter is taper bored to fit the spindle and is interchangeable with the chuck. The machine may be used also for drilling small parts or producing shouldered studs by the hollow mill process. A feed attachment is available, providing the necessary pressure without effort on the part of the operator.

The No. 1 machine is of smaller size, using taps ranging from No. 3 to No. 10. It is equipped with flat friction disks to increase its sensitiveness. A variety of jigs and fixtures is available for production work on these machines.

JANUARY INDICATIONS OF THE BUSINESS TREND

1. Business and industry are moving upward in the cycle during a period of recovery from depression levels.

2. Judging by the past and assuming the validity of the cycle theory, they will continue upward for several months.

3. At present there is a conflict between two forces: (a) The shortness of the preceding recession and the incomplete liquidation make for but a moderate upswing. (b) The tendency of inflation to increase, however, makes for a greater boom. It is yet impossible to say with certainty which force will win, but the chances at the present time seem to favor the former.

4. The trend of earnings in the manufacturing and farming industries is decidedly upward.

5. The barometers of iron and steel demand all suggest further gains in that industry.

BY DR. LEWIS H. HANEY
Director, New York University Bureau of Business Research

INDUSTRY and business are now about as near equilibrium as at any time since the first month or two of 1923. On the whole, conditions are such that with moderation and caution relative stability might be hoped for. The production of commodities has moved upward in about the same proportion that prices have advanced, which in itself indicates a desirable condition of equilibrium. The production and stocks of commodities are probably not far from the normal trend level. The depression of 1924 was short and not deep, and the prompt recovery which has followed has thus far merely served to bring industry back to normal. If, therefore, the present condition of caution were to continue, we might escape a boom and the subsequent sharp recessions.

It must be noted, however, that *already production and prices have approached very closely the levels attained at the* 1923 *peak.* The chief difference between the situation now and that in early 1923 is that money is much easier. The big question is —Will production forge ahead to a level which can not be maintained? Will prices, under the influence of abundant money and credit, become subject to dangerous inflation? The future of industry in this country depends upon moderation in production and prevention of inflation.

Everywhere the leading industrial interests have gone on record as recommending caution and moderation. The danger is that competition and the desire to secure large volume to offset narrow profit margins will outweigh this spirit of caution. Production in general is not yet excessive, but is already a little over the normal level and, in view of the rather large stocks of commodities on hand, could easily become over-expanded. The next month or two will tell the story. If infla-

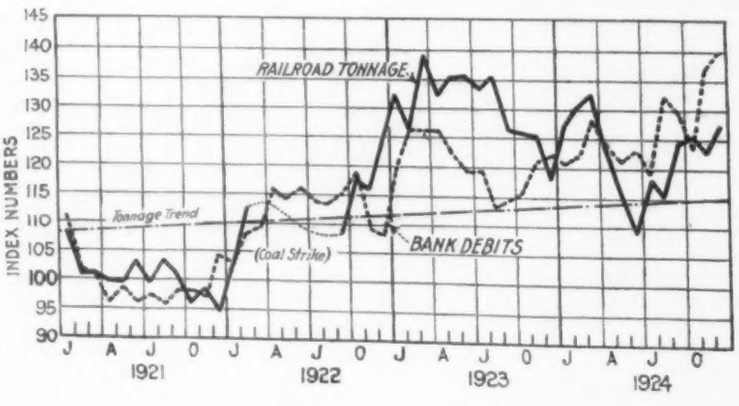


Fig. 1. The Business Cycle: Railroad Traffic and Bank Debits

The railroad tonnage curve is based on the car loadings and tons per car of class 1 railroads and is adjusted for seasonal variation. The trend line shows the rate of the average monthly growth during the last ten years. The bank debits curve is the monthly average of total bank debits adjusted for seasonal variation. The curves are based on index numbers with the monthly average for 1921 as 100

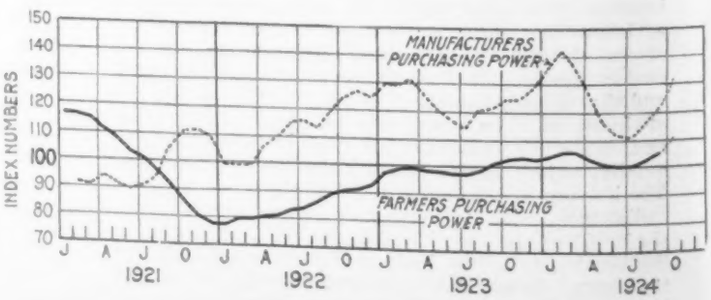


Fig. 2. Trend of Earnings: Factory and Farm

The curves shown in Fig. 2 are three-month moving averages centered on the middle month. The last points in the curves, however, are the indexes for the latest single month available. The index of manufacturing earnings represents the margin between prices and the chief items of expense multiplied by volume of production, or shipments. The index of farm earnings is the product of farm prices multiplied by the estimated quantity marketed during the month. It covers all the chief crops, from corn and cotton to hogs and milk. The October figures are estimates of the trend

tion in money and credit increases and a speculative spirit continues to grow, we will be in for boom and collapse.

The key to the situation lies in the inflation question. There is still danger of inflation making further progress. Already there is considerable inflation in the strict sense of the word, since the value of the dollar has clearly decreased on account of the larger supply of money and credit. This is the chief reason why the general price level is mounting so rapidly and why the dollar is worth less in comparison with the pound sterling. Money, as already noted, is much easier than in 1923. After a series of monthly price advances averaging about 2 per cent a month, there came the December gain of about 3½ per cent. The loans and discounts of the member banks of the Federal Reserve System continue to expand steadily. The continued rise in the price level, in spite of the swelling volume of production, indicates greater readiness to buy and suggests the possibility of less caution on the part of merchants than has prevailed in the past few years.

It is believed, however, that the amount of inflation is not yet serious and we still doubt if it is to become so. It is simply noted that the danger appears to be greater than seemed likely a few months ago.

To sum up: If inflation is checked, the prospect is for a moderate peak in the spring or summer followed by only a moderate recession. If inflation is not checked soon, we are in for a considerable "boom" with a sharp recession following. It is not believed that any certain prediction can be made at the present moment. Inflation is influenced by banking policy, and international considerations are involved. Our opinion leans toward the conclusion that a more moderate advance is probable and that rather stable conditions will obtain during the next few months. Certainly no immediate recession is in prospect.

The Business Cycle

THE two curves shown in Fig. 1 are chosen as the most logical indexes of the general trend of industry and business. The curve showing the movement of the monthly railroad tonnage is the best index of physical volume. That showing the trend of bank debits is the best index of total dollar sales.

These curves show that a true cyclical peak was reached in the spring of 1923, followed by a decline (which was most marked in physical volume), and by a recovery last fall.

In December, 1924, both railroad tonnage and bank debits had reached a point indicating a large measure of recovery from the recent moderate depression. Railroad traffic was still considerably below the high levels of 1923, but bank debits have attained the highest point reached in recent years. The large increase in the volume of checks drawn is in part due to great speculation in stocks and commodities and in part to the rapid rise in prices.

The relatively high level of bank debits shows that *dollar sales have increased more rapidly than physical volume,* which is largely explainable by the higher prices. *Probably if the physical volume of wholesale and retail business could be measured, it would be found that this volume would be less than the volume of production.*

With reference to the trend line which shows the rate at which railroad tonnage has been growing over

Favorable and Unfavorable Conditions in the Present Industrial Situation

THE accompanying lists are designed to set forth the chief fundamental factors affecting the trend of the industry. The fact that there are several favorable conditions and almost an equal number of unfavorable conditions indicates that the situation is not onesided. It must not be thought, however, that the following lists are designed to indicate quantitatively the exact number of favorable and unfavorable conditions. It is only by considering the importance of each point that a net conclusion can be drawn.

—

The net conclusion appears to be that for the *immediate future* the balance of the fundamental conditions suggests improvement, but that later on trouble is in store unless the unfavorable conditions are changed. The unfavorable factors appear to be of sufficient importance to prevent the development of pronounced boom conditions and to suggest a less favorable turn before the year is over.

Favorable Factors.

(1) A general advance in commodity prices is in progress (at the same time that the volume of production and business is increasing.)

(2) There is a general increase in the volume of business. Production of coal, iron and other basic commodities is growing, railroad traffic is increasing, and bank debits have moved sharply upward.

(3) Unfilled orders in many important lines have increased.

(4) New business enterprises have increased, indicating that business sentiment is improving.

(5) In both manufacturing and agriculture increased profit margins are being shown.

(6) The employment and earnings of labor have recently turned up without any important wage advances.

(7) Money and credit continue easy.

Unfavorable Factors.

(1) Stocks of commodities in first hands are large and the production of basic industries is gaining somewhat on shipments.

(2) Production is going ahead a little too fast and is probably already above normal requirements.

(3) The buying power of consumers is limited by the increasing cost of living and heavy commitments for goods bought "on time."

(4) Unfilled orders, while increasing, are small in comparison with production.

(5) The outlook for exports is not good in most manufactured lines with European competition on the increase. In recent months the trend of our exports has been down, while imports have grown, allowing for seasonal variations. As iron and steel prices rise the imports of foreign iron, rails and other steel products will grow.

(6) The trend of business failures has recently been upward.

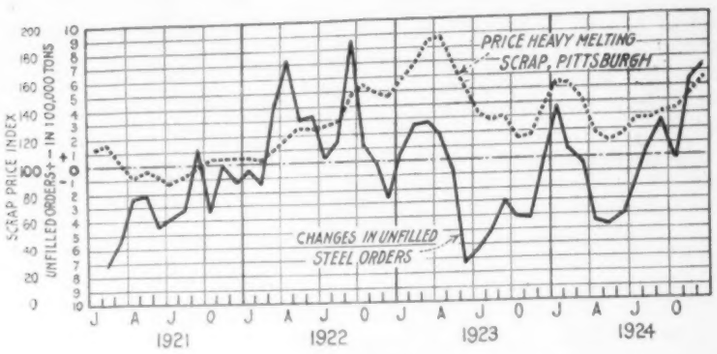

PRICE HEAVY MELTING SCRAP, PITTSBURGH
CHANGES IN UNFILLED STEEL ORDERS
SCRAP PRICE INDEX
UNFILLED ORDERS + - IN 100,000 TONS
J A J O J A J O J A J O J A J O
1921
1922
1923
1924

Fig. 3. Steel Barometers: Unfilled Orders and Scrap Price

The unfilled orders curve represents *changes* in unfilled orders, allowing for seasonal variation. A rise in the curve may indicate either a smaller decrease or a larger increase than occurred in the preceding month. The scrap price is that of heavy melting steel scrap at Pittsburgh, as reported in THE IRON AGE

a long period of years, it is apparent that recently traffic has been high. This indicates improved railroad business and also suggests that the general level of production is somewhat above normal.

Reasoning on the theory of business cycles, it may be concluded that a major up-swing is now in progress which should carry on for several months.

Earnings Trend: Manufacturing and Farming

THE curves shown in Fig. 2 are here presented for the first time. They represent the trend of the average net earnings of 18 of our chief manufacturing industries and 14 of the most important crops, including live stock and milk.

It is clear that the trend of earnings, both in manufacturing and agriculture, is now upward, and in our opinion it will continue so well into 1925. *Since* 1921, *farm earnings have risen faster than the earnings of manufacturers, and toward the end of* 1924 *had reached the highest point since early in* 1921. This is undoubtedly one of the most encouraging factors in the present situation, since it means a better industrial balance.

Earnings in manufactures, after reaching a low point in the middle of 1924, have already risen nearly to the 1923 peak. *It may be confidently predicted that better earnings statements will appear in the first quarter of* 1925. This condition has been discounted in the recent advances in the stock market.

Steel Barometer: Unfilled Orders and Scrap Price

BOTH of the indexes shown by the curves in Fig. 3 are valuable as barometers of the steel industry and are accordingly of general interest, since the steel industry is very sensitive to business conditions in general.

Both of the indexes show a marked upward trend in the second half of 1924 *and if they have their usual barometric significance they indicate that further gains are probable during the next month or two.*

Scrap prices have moved upward since May of last year, thus anticipating the advance in iron and steel prices by several months. The scrap market will be watched with interest for early indications of an end in the current rise.

The unfilled orders of the United States Steel Corporation are often highly barometric and the large increase in December indicates that no setback in the steel industry is likely in the near future. It may be noted, however, that the December unfilled orders, making allowance for seasonal variation, did not increase so much in comparison with the November increase as was the case in the preceding month. Accordingly, the *rate of change* in the upward movement is less. In the past this has often indicated the approach of a reversal in the trend.

It should be borne in mind that these curves anticipate the trend of actual business. The steel industry is likely to show strength for several months after the curves turn down.

Structural Steel and Steel Castings

THE two curves shown in Fig. 4 are sensitive indicators of demand for steel products. It is significant, therefore, that both are on the up grade. The structural steel index at the end of 1924 stood higher than at the end of 1923, and, in fact, was nearly up to the peak level of that year. The steel castings index started to move upward from a lower point, but has advanced more rapidly. *Judging solely by the past, structural bookings are not likely to increase for more than one or two months, while the bookings of castings will probably rise somewhat longer and the castings curve cross that of structural steel bookings.*

Automobile, Petroleum and Mining Industries

EACH of the curves shown in Fig. 5 represents the month to month trend of activity in an industry which uses considerable quantities of iron and steel. All of the curves shown moved downward in November, which is the latest month for which complete data are available. The lower production of crude petroleum and reduced drilling activity strongly suggest a smaller demand for plates, casing and other oil country goods. The trend of the automobile production curve is in

(*Concluded on page* 281)

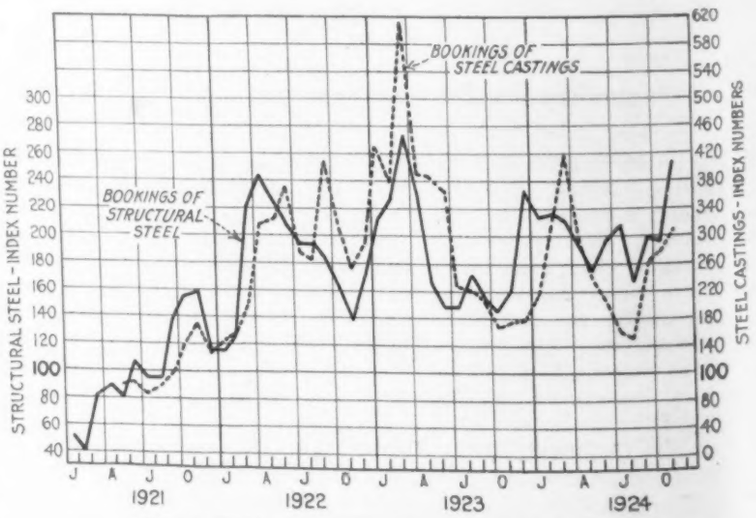

BOOKINGS OF STEEL CASTINGS
BOOKINGS OF STRUCTURAL STEEL
STRUCTURAL STEEL - INDEX NUMBER
STEEL CASTINGS - INDEX NUMBERS
J A J O J A J O J A J O J A J O
1921
1922
1923
1924

Fig. 4. Bookings of Structural Steel and Steel Castings

The curves shown in Fig. 4 represent the movement of index numbers referred to the average for 1921 as 100. The index numbers are based on data recorded by the Department of Commerce and are not adjusted for seasonal variation

In This Issue

"High pressure selling and marketing expenditure in unprofitable areas is a national waste," says Hoover.—Page 287.

German automobile manufacturer places large order for American machine tools.—Page 316.

Nine 24-hr. days' continuous operation required to make first cut in huge marine reduction gear produced at Philadelphia Navy Yard.—Page 263.

"The future of industry in this country depends upon moderation and prevention of inflation."—Page 276.

Germany underselling America for Japanese business in rails, pipe and structural steel.—Page 314.

Large gain in steel casting bookings. December total 96,164 tons, 30 per cent above November.—Page 285.

Production of coke in 1924 totaled 43,463,000 tons, 78 per cent of which was by-product.—Page 281.

"It may be confidently predicted that better earnings statements will appear in the first quarter of 1925."—Page 278.

Increased profits and elimination of labor troubles the result of permitting employees to participate in management.—Page 273.

"If inflation in money and credit increases and a speculative spirit continues to grow, we will be in for a boom and collapse."—Page 277.

In resisting wear by abrasion in certain services, hardened plain steel is superior to manganese steel, stellite and chilled iron, according to Bureau of Standards' preliminary tests.—Page 313.

Huge waste to business and labor, brought about by periodic booms with accompanying slumps, can be largely avoided by collection of proper statistics, says Hoover.—Page 287.

Charged with maintaining through cooperation with dealers a plan for re-selling his products at a standard agreed upon price, Ohio pipe-threading machine builder in toils of Federal Trade Commission.—Page 281.

Low temperature carburizing produces longer-lived product. More economical than high-temperature carburizing, says speaker at Steel Treating Society's Cincinnati meeting.—Page 274.

Confusion in manganese ore importation figures caused by Government reporting tonnage of manganese metal content rather than ore tonnage.—Page 282.

"Firm and gradually rising money rates are in prospect," says Dr. Haney.—Page 281.

"Constant Reader" suggests Henry Ford served his own best interests ultimately in buying Belgian rails.—Page 285.

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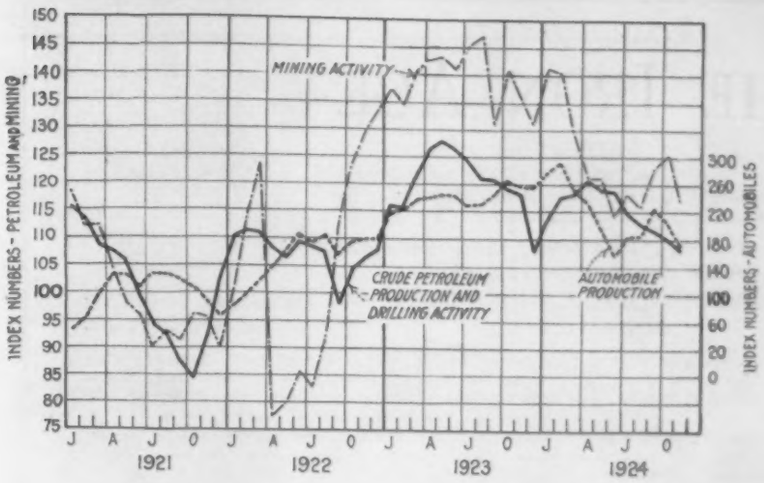

Fig. 5. Automobile, Petroleum and Mining Activity

The petroleum curve is the average of the monthly production reported by the U. S. Geological Survey and drilling activity as reported by the *Oil City Derrick*, each adjusted for seasonal variation. The automobile curve shows the monthly production of all cars and trucks and adjustment is made for seasonal variation. The mining production curve is as reported by Harvard University and is adjusted for seasonal variation. All figures are index numbers based on the 1921 average

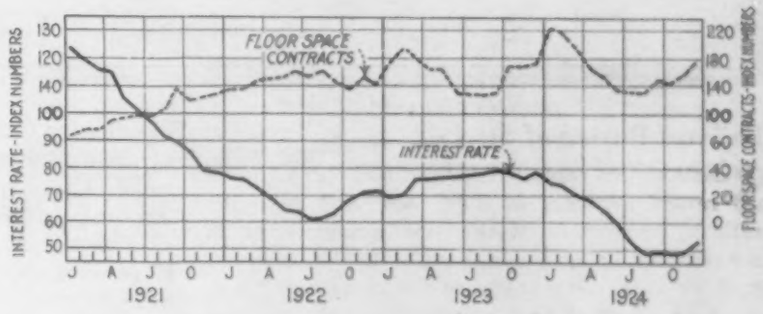

Fig. 6. Interest Rate and Building Activity

The curve of building activity is based on the number of square feet of floor space in building contracts awarded as reported by the F. W. Dodge Corporation. Seasonal variation is eliminated. The interest rate curve is the monthly average of rates on best commercial paper, adjusted for seasonal variation

(*Concluded from page* 278)

marked contrast to previous year ends. It indicates a cautious adjustment of production schedules to demand. The automobile manufacturers will undoubtedly take a large quantity of steel in 1925, but they face very sharp competition and low margins. The trend toward cheaper cars of the closed type is the outstanding feature. Deliveries of the General Motors Co. in December, while greater than in November, were smaller than in December, 1923.

Money Rates and Building Activity

BUILDING activity decreased slightly in December. Such a decrease, however, is usual in that month, and, after eliminating sensonal variation, the index rises as is shown in the graph. In other words, the December decrease was less than normal. *While the general trend of building activity has been slightly upward since August, it is not believed that it will reach the* 1923 *peak, to say nothing of that of* 1924. *The January figures will tell the story.*

The interest rate moved up in December after a decline which has lasted for over a year. The usual seasonal variation is allowed for and consequently this upturn marks a real change in trend. *Firm and gradually rising money rates are in prospect.* The supply of money and credit, however, is so great that no advance sufficient to hamper business is probable during the first half of the year.

Reducing Costs to Lowest Level

WASHINGTON, Jan. 20.—The necessity of maintaining a high wage level requires that all processes of manufacture and distribution be reduced to the lowest possible cost, says Secretary of Commerce Hoover, in the foreword of the booklet entitled "Simplified Practice—What It Is and What It Offers," which has just been issued by the Division of Simplified Practice, Department of Commerce. The Secretary says this can be done through the elimination of those wastes arising out of too high a degree of diversification in certain basic products. He declares that there is a great area still untouched in which application of wage elimination measures may save not millions, but billions.

Order Issued Against Toledo Company

WASHINGTON, Jan. 20.—The Federal Trade Commission has just issued an order against the Toledo Pipe Threading Machine Co., Toledo, Ohio, requiring it to discontinue alleged practices which the commission holds are unfair methods of competition. The commission charges that the company maintained through cooperation with dealers a plan for reselling its products at a standard agreed upon price. The company makes pipe threading, boring and cutting tools.

Coke Production for Last Year

WASHINGTON, Jan. 20.—Production of by-product coke in December totaled 3,067,000 net tons compared with 2,929,000 tons in November, according to the Geological Survey. The daily rate of output in December was 99,000 tons, an increase of 1.4 per cent over the November rate. The ratio of production to capacity was 79.1 per cent. Of the 75 plants, 68 were in operation and 7 were idle. In the beehive branch of the industry the December production is estimated at 900,000 tons, as against 630,000 tons in November. The total production of coke from both by-product and beehive was 3,967,000 tons, the largest in any month since April, 1924.

The year 1924 as a whole showed a production of 43,463,000 tons of coke, or about the same as 1919. The output of by-product coke was 33,795,000 tons and has been exceeded but once in the history of this industry, the exception being 1923, when the record of 37,597,664 tons was reached. The year's production of beehive coke was approximately 9,668,000 tons, against 19,379,000 in 1923, and 8,573,000 in 1922. By-product ovens thus contributed 77.8 per cent of the 1924 output, and beehive ovens, 22.2 per cent. In 1923, the proportions were—by-product, 66 per cent; beehive, 34 per cent; and in 1921, by-product, 78.1 per cent; and beehive, 21.9 per cent.

ESTABLISHED 1855

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Railroad Buying of Steel

SUMMARIES compiled for the last three annual review numbers of THE IRON AGE gave the railroad proportion of the steel produced at 22 per cent for 1922, 27 per cent for 1923 and 28 per cent for 1924. The object in the compilation was to cover all steel that passed into railroad use, whether or not bought directly by the railroads.

These percentages are much smaller than those that used to be suggested, 15 years and more ago, as "the railroad proportion." Those estimates were not based upon any statistical compilation, but represented the handing down of very old estimates, made when the railroads were being built and when other uses of iron and steel were very limited.

An interesting comparison can be made to indicate the position the railroads now occupy with respect to the steel industry by referring to the growth, respectively, of the property investment account of the railroads, the growth of steel making capacity, and the rise in steel prices. The comparison is, of course, not conclusive as to what the railroads can or should do in making purchases, but it is suggestive of the position they occupy.

Of Class I roads the investment in road and equipment on June 30, 1911, was $14,246,167,475. The similar account for Dec. 31, 1924, may be estimated at $21,250,000,000. This is an increase of almost 50 per cent. The roads may be worth much more than that figure, but it is of no benefit to them if they are, for they are limited as to their passenger and freight charges. The valuation that has been in progress for so many years is still held to a pre-war basis. Perhaps a hotel valued at a certain amount in 1913, and bonded to a certain percentage of that amount, might now be valued much higher and be able to issue additional bonds in consequence, to finance an addition, but certainly the railroads cannot do this.

It is difficult to estimate closely the capacity of the steel industry at any particular date in the past, on account of the bursts of new construction and the wide fluctuations in actual production, but by drawing a smoothing curve through estimates of capacity for different dates an ingot capacity of about 32,000,000 tons for July 1, 1911, is indicated. Capacity as now estimated is about 54,000,000 tons, or 69 per cent increase.

Finished steel prices are now approximately 67 per cent above their average level in the calendar year 1911.

Thus we have three factors. From the middle of 1911 to the present time there are increases of 50 per cent in the railroad property account, 67 per cent in steel prices and 69 per cent in steel making capacity. As a matter of arithmetic, not of prediction, if the railroads should now spend 50 per cent more dollars they would receive only 90 per cent as much steel tonnage, and this steel would represent only 53 per cent as large a proportion of the present steel capacity as 1911 purchases would have been of 1911 steel capacity.

As a matter of fact the railroads can and will do better than this. They have been forced to economize rigidly and they have had a great measure of success in the past two years in getting better service from their equipment and reducing expenditures for supplies, such as coal. Their buying power, although it has limits, is large, and the expenditures will be dictated by considerations of economy in operation.

The Manganese Muddle

THOSE interested in the manganese market have been puzzled for some time by the apparent discrepancy in our importations of manganese ore and the country's production of ferromanganese. It has been a matter of much comment in the trade that so much ferromanganese could be made from so little ore. To the end of November, according to Government statistics, the importation of manganese ore in 1924 was 236,635 tons. Under the reckoning of the past, with allowance for manganese loss in the blast furnace, this would represent about 95,000 tons of ferromanganese. The fact is that in the first eleven months of 1924 our production of ferromanganese, at 183,600 tons, was nearly twice that amount. The production of domestic manganese ore being negligible, a question has naturally been

raised as to the accuracy of the statistics of ore imports.

It now develops that the Government data on manganese ore, since Sept. 22, 1922, when the new tariff went into effect, have been given in tons of manganese content, though all the time the official statistics have carried the original designation of "manganese ore and oxide." Since the metallic content of the imported ores ordinarily runs between 45 and 50 per cent, the fact is that the Government reports have accounted for less than half the manganese ore actually received.

In other words, the Government since Sept. 22, 1922, has not issued any statistics of manganese ore, but has simply indicated the number of tons of metallic manganese brought into the country, on which the Treasury Department has collected a duty of 1 cent per pound under the tariff act effective Sept. 22, 1922. Similarly, it appears, the statistics of ferromanganese imported into the United States no longer represent the weight of ferromanganese as such, but the weight of its 80 per cent, or less, of manganese content.

Manganese ore is manganese ore, just as iron ore is iron ore. The trade wants to know how much ore came in, in the case of each. For statistical purposes it matters not that metallic manganese is dutiable, while metallic iron is not. For years the statistics of the imports of manganese ore and of ferromanganese have been given in Government reports, and there has been widespread interest in them; but for more than two years—though without any general knowledge of the fact among those chiefly concerned—these statistics have been made up simply from the Treasury Department standpoint. Now that the misleading character of the published information is appreciated it is to be hoped that hereafter the interest of the steel trade and of every seller or user of manganese ore or ferromanganese will be consulted. That would mean that the Government make it possible to compare manganese ore imports with domestic production of higher grade manganese ore and in like manner to compare our ferromanganese imports with the domestic production, as well as with the ferromanganese production of Great Britain and other countries. It is most regrettable that the steel trade is without any official record of manganese ore and ferromanganese imports from Sept. 22, 1922, to the present time.

KEEN competition demands efficient machine tools. So runs a slogan of the National Machine Tool Builders' Association, aimed at the great industries that work in metals. Forecasters agree that while business will improve during the next few months the country need not expect a boom. If this proves true, as it promises to do, competition will be keen. Orders under such conditions will go to the shops that are best able to meet demand for high quality, prompt deliveries and reasonable prices. Competition of this sort requires low cost output, and the line of argument comes back to the slogan with which we started out, that keen competition demands efficient machine tools.

High Remuneration of Town Labor

IN a recent editorial we referred to the absence of fundamental statistics of our national economy and to the way we are forced to make inferences from fragmentary data. A new contribution of the latter order has come from the U. S. Department of Labor.

The department compiled the wage scales and work hours of about 900,000 members of organized trades in 66 cities. The number of workers reckoned is nearly 25 per cent of the membership of the American Federation of Labor at the maximum and nearly one-third of what it is at present. This is a large sample, not only of organized labor but also of all labor of the kind represented, for we may safely assume that non-union carpenters, painters, pipe fitters, etc., receive the union scale of wage.

We may digress here and anticipate somewhat in our deductions before drawing attention to the evidence. When the labor of an industry is completely unionized and competition is excluded, as in anthracite coal mining, labor is able to exact its demands. With complete unionization, but without the exclusion of competition, as in transportation, labor may speak with a powerful, but not dominating, voice. In the trades wherein unionization is only partial and is largely a geographical affair, the factors of supply and demand play more of a part; in fact, controlling. With strong demand and scarce supply, union and non-union workers get the same wages. The difference between the union and non-union bricklayer, where such workers are in the same district, is not that the latter works for a lower rate of wage but rather that he is willing to lay more brick. The influence of the unions in the trades, therefore, is not upon the wage scale by arbitrary exaction, but rather by limiting the supply of workers and the amount of work they may do.

When, however, the supply of labor in an industry is abundant and terrorism is unavailing, as in the instance of bituminous coal mining, competition produces a difference between the union and non-union rates. Non-union men are then willing to work at lower rates in order to get full time, while union men adhere to card rates which they are able to get for only part of their time. All in all, the great effect of unionism is not directly upon wage scales but rather is it indirectly by limiting the permissible performance of work, by restricting admission into the several trades, and by bringing about a cessation from work altogether when nominal rates are not to its liking.

Some such deductions may be made by anybody from the subjoined table of wage rates by years beginning with 1913, which is taken as the base, in several of our major industries and vocations. The column headed "trades" gives the set of figures recently issued by the Department of Labor. In comparison with some of the other columns, these may be exaggerated figures, for in the railroad, steel, factory and anthracite coal mining industries the indices are computed by

dividing the total annual payment for labor by the average number of men employed, while for the trades the Department of Labor compares simply the scales as of a certain date in each year without any reference to the actual earnings. It is likely that annual earnings in the several trades did not increase in the same proportion as the scales. It is certain that there could have been no result the other way around.

Year	Trades	Factory	Steel	Anthracite	Railroad
1913	100.0	...	100.0	100.0	....
1914	101.9	...	100.0	....	....
1915	102.8	101	102.2	96.2	....
1916	107.2	114	115.2	114.6	116.7
1917	114.1	129	143.2	113.2	130.2
1918	132.7	160	186.1	173.3	184.1
1919	154.5	185	210.1	202.9	192.8
1920	199.0	222	240.3	240.6	236.1
1921	205.3	203	191.8	261.9	216.2
1922	193.1	197	165.9	....	210.6
1923	210.6	214	198.9	....	210.0
1924	228.1	218	....	....	....

An important revelation of the Department of Labor is that, taking the average number of work hours in the trades in 1913 at 100, the average in 1920 was only 93.8, in the neighborhood of which figure it has hovered ever since. In other words, there has been a diminution in the working time in the trades of about 6 per cent since 1913. This is similar to the finding of the National Industrial Conference Board that in 3800 manufacturing plants representing 26 major industries and accounting for upward of 25 per cent of the workers in those industries, between the middles of 1914 and 1920 the nominal week of work was reduced from 55.1 hours to 50.7. Both of these evidences therefore are in line with the representations in recent editorials in this journal that the American workman is averaging less time than 10 years ago, along with the intimation that this may mean diminished productivity.

Space will not permit us to go into the underlying economic meaning of the extraordinary rise in the wages of certain classes of labor that has come in the last 10 years, but certain incontestable deductions from scientific evidence may be stated:

1. The iron and coal mines, iron and steel works, the steam railroads and the hand trades of the United States occupy upward of one-third of all the workers. They comprise practically all of the group of town labor outside of the "white collar" workers and those in domestic service. With no disrespect but simply for the sake of definition, we may describe them as the "overall" branch of town labor.

2. With some irregularities in the progression, all of the major divisions of the "overall" branch of town labor arrived at the position in 1923-24 of getting 2 to 2.25 times, in terms of dollars, the wages of 1913 and there was no great difference among them, irrespective of the conditions of closed or open shop.

3. The ratio of increase is greatly in excess of the increase in commodity prices and the computed cost of living.

4. In the non-unionized iron and steel industry, downward adjustments occurred during the depression of 1921-22 to a greater extent than in the unionized occupations.

5. In factory work and in the trades there has been a curtailment of 6 to 8 per cent in working time since 1913, and especially since the end of the war.

In the broadest aspect these facts reflect the great change in the division of the produce of industry that began during the war and that since the end thereof has been intensified rather than tending to revert to former conditions.

The Government and Business

THE smoke of the Presidential campaign having cleared away, subjects connected with the relationship of the Government to business are now being discussed on a high plane, free from partisan feeling and promising results of large importance.

In this issue of THE IRON AGE in the report of the national distribution conference of the Chamber of Commerce of the United States, Secretary Hoover with characteristic perspicacity and forcefulness shows how much waste can be prevented and indicates the wide field of usefulness of business associations.

Bernard M. Baruch, in his valuable report as chairman of the War Industries Board, dwelt at length upon the history of national associations of business men, their functions during the war, and the problems of peace time growing out of their formation. In connection with the address made some weeks ago by Mr. Baruch at the fifth annual luncheon reunion in New York of former members of the War Industries Board, and an editorial comment thereon published in THE IRON AGE, Mr. Baruch informs us that his position has been somewhat misunderstood and he calls attention to his views as expressed in his report as chairman, issued in 1921. He then said:

> The question is what kind of Government organization can be devised to safeguard the public interest while these associations are preserved to carry on the good work of which they are capable. The country will quite properly demand the vigorous enforcement of all proper measures for the suppression of unfair competition and unreasonable restraint of trade. But this essentially negative policy of curbing vicious practices should, in the public interest, be supplemented by a positive program, and to this end the experience of the War Industries Board points to the desirability of investing some Government agency, perhaps the Department of Commerce or the Federal Trade Commission, with constructive as well as inquisitorial powers—an agency whose duty it should be to encourage, under strict Government supervision, such cooperation and coordination in industry as should tend to increase production, eliminate waste, conserve natural resources, improve the quality of products, promote efficiency in operation, and thus reduce costs to the ultimate consumer.

Mr. Baruch believes that such a plan would provide a way of approaching industry or, rather, of inviting industry to approach the Government in a friendly way with a view to helping and not to hindering. He states that his recent address in New York was in entire harmony with the position taken in his report and was made with a view to stimulating thought and arousing discussion rather than of advocating any particular plan of action. Practical difficulties will be suggested, but the ideas of Mr. Baruch are based on long experience as a business man and as chairman of the great war board and are worthy of open-minded consideration.

CORRESPONDENCE

Considers Henry Ford's Purchase of Belgian Rails Good Business

To the Editor: Your editorial in the issue of Jan. 8 concerning "Mr. Ford's Belgian Rails" certainly proves that human nature is much the same the world over. For the past nine years I have been located outside of my native country (the United States), participating in no small way in the export of American made steel products. The experience I have gained directly by intimate personal contact with "foreigners" (a poor token to the people of the British nations), as well as a study of similar conditions in other countries, shows that most of us at some time or another allow our patriotic emotions to run away with our good common sense. Particularly is this true in cases where the issue does not pertain to our own business. When it does, we are prone to adopt the attitude of insisting of others that they keep "hands off."

If there happened to be a country in the world where any commodity could be produced from the ground up to the finished commodity, ready for consumption without the slightest assistance of some foreign element—directly or indirectly—and if that country could and would regularly consume all that could be produced of that commodity, then we would rightly say let "patriotism" be the only guiding policy of those engaged in the production of that commodity.

But where is there such a country or even such a commodity? It reminds me of the continual comedy performed by government officials in all countries, even in this enlightened age, in telling their constituents loudly that they will purchase goods only in their own respective countries—piffle of the highest order!

Mr. Ford's officers appreciate this. Their reply was given in the same absurd strain as the question put to them, which is admittedly good psychology if not satisfactory. They know that if they are to maintain the foreign markets which they have spent considerable time and money to develop, they must also purchase in those markets, particularly when it is to their best advantage to do so. And an institution so successful, so efficient and so world-wide as the Ford Motor Co. is liable in most cases to conserve its own interests whether this seems "usual" to others or not.

REGULAR READER.

Commends Steel Founders for High Inspection Standard

To the Editor: Congratulations on the splendid article, "Inspection Standards for Steel Castings," by W. J. Corbett, in your issue of Jan. 8. Hats off to the group of manufacturers who have had the far-sighted judgment and rare common sense to recognize the value of technical control in metallurgical operations and the courage and initiative to voluntarily adopt strict but rational specifications governing their own product.

This sort of thing in industry—and there are many examples of it, though not all of them so striking—seems to be one of the best signs of the times. The writer can vouch for a similar attitude on the part of various manufacturers of products which must meet the exacting requirements of aircraft construction.

The ultimate consequence of such a policy must be a reduction of waste to the consumer as well as to the producer, and a broadened market through the greater service rendered by the product and the greater confidence placed in it by the user.

The ranks of those who consider material specifications a nuisance and technical control an expensive folly are steadily diminishing. H. C. KNERR,

Naval Aircraft Factory, Philadelphia — Metallurgist

Bookings of Steel Castings

WASHINGTON, Jan. 20.—December bookings of steel castings, based on reports from principal manufacturers representing over two-thirds of the commercial castings capacity of the United States, are reported by the Department of Commerce as 96,164 tons, or 95.8 per cent of shop capacity, as against 74,220 tons in November, or 73.9 per cent of shop capacity.

Total bookings by these firms for 1924 amounted to 772,840 tons or 64.1 per cent of total capacity; 388,357 tons being devoted to railroad specialties and 384,483 tons to miscellaneous castings. Bookings in 1923 totaled 894,780 tons or 74.6 per cent of capacity.

The following table shows the bookings of commercial steel castings for the past fifteen months by 70 identical companies, with a monthly capacity of 100,400 tons in 1924, of which 43,000 tons are usually devoted to railroad specialties and 57,400 to miscellaneous castings. This total capacity compares with 100,000 tons capacity of these firms in 1923 and 97,350 tons in 1922, the capacity devoted to railroad specialties comparing with 41,900 tons in 1923 and 39,800 tons in 1922 and miscellaneous capacity comparing with 58,100 tons in 1923 and 57,550 tons in 1922.

Bookings of Commercial Steel Castings

	Total		Railroad Specialties		Miscellaneous Castings	
	Net Tons	Per Cent of Capacity	Net Tons	Per Cent of Capacity	Net Tons	Per Cent of Capacity
Year 1922.....	812,741	69.6	404,682	84.7	408,059	59.1
Year 1923.....	894,780	74.6	386,939	77.0	507,841	72.8
Year 1924.....	772,840	64.1	388,357	75.3	384,483	55.8
October, 1923..	39,651	39.7	10,641	25.4	29,010	49.9
November	42,008	42.0	13,645	32.6	28,363	48.8
December	42,762	42.8	15,600	37.2	27,162	46.8
January, 1924.	51,406	51.2	19,572	45.5	31,834	55.5
February	73,138	72.8	35,474	82.5	37,664	65.6
March	100,514	100.1	59,778	139.0	40,736	71.0
April	68,119	67.8	33,151	77.1	34,968	60.9
May	56,801	56.6	28,064	65.3	28,737	50.1
June	48,718	48.5	26,170	60.1	22,548	39.3
July	38,191	38.0	16,244	37.8	21,947	38.2
August	36,363	36.2	14,532	33.8	21,831	38.0
September	62,509	62.3	29,567	68.8	32,942	57.4
October	66,697	66.4	31,130	72.4	35,567	62.0
November	74,220	73.9	41,343	96.1	32,877	57.3
December	96,164	95.8	53,332	124.0	42,832	74.6

Will Double Production

The Vulcan Mold & Iron Co., Latrobe, Pa., has started work on an extension to its plant which will permit the company to practically double its present production of ingot molds, stools and castings. The main building, the power house and the drying ovens are being enlarged and additional conveying equipment is to be installed. The decision to go ahead with this extension program was reached after the company had operated its plant at capacity every day in 1924. E. H. Williams is president of the company.

The Iron Age and Its Readers

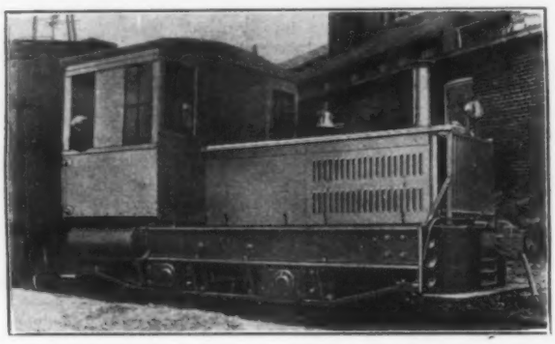
NOT often do we have opportunity to present to our readers the sort of article which appears on pages 203 to 211, inclusive, of the issue of Jan. 15, dealing with blast furnace research. Though of immediate interest to blast furnacemen, it typifies a method which reasonably might be extended to a variety of uses in other industries. Observation of manufacturing and other results carries with it so many variables that it is difficult to take proper account of all of them without some such short-hand method as is set forth by these Pittsburgh contributors, Messrs. Imhoff and Ackerman. The value of reported observations lies in the thorough recording of facts, so that these may be accurately analyzed and compared with results obtained, perhaps after a considerable interval of time.

Gasoline Locomotive for Switching Service

An 18-ton gasoline locomotive, designated as the model HL and intended for service in switching railroad cars and for handling large industrial and construction cars, has been added to the line of the Fate-Root-Heath Co., Plymouth, Ohio. It is available in track gages from 23⅝ in. to 56½ in.

The foundation of the locomotive, which is illustrated herewith, is made up of a heavy frame with steel girder-beam and bar sides and cast steel bumpers. The wheels, all four of which are drivers, are 33 in. in diameter. The axles are of steel, heat treated. They are fitted with heavy-duty roller bearings with hardened sleeves to take up wear, and are inclosed in dust-proof journal boxes carrying bronze thrust plates. Shims that space the journal boxes provide for chain adjustment.

The power plant consists of a Climax R-6 six-cylinder vertical L-head engine with full force feed oiling system and built-in governor. A high-tension dual ignition system using both magneto and battery is provided, and the carburetor is said to be designed especially for the engine and for the sudden demand for its full power. A 12-volt back-geared starting motor and large storage battery are provided. Cooling is by means of a Modine sectional spired core radiator and 30-in. fan. The clutch is a combination of Twin Disk and Plymouth design and the clutch shaft is drilled to permit lubricating the pilots bearing in the flywheel with an Alemite gun. The transmission is of the company's sliding gear type with four speeds



Gasoline Switching Locomotive. All four wheels are driven

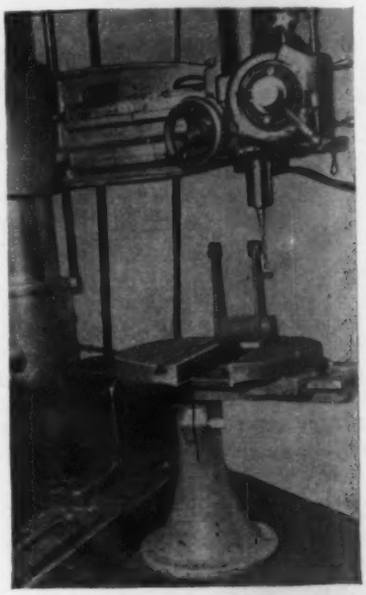
from 2 2-3 to 24 miles per hour, both forward and reverse. The final driving shaft and gear are housed in the gear case, and the drive is direct from the transmission to each axle, no jack shaft being employed. The gears are of alloy steel, hardened and have cut teeth. Shafting and bevel reversing gears are carried on ball bearings mounted in and lubricated automatically from the inside of the gear case.

Hand brakes of the hand-wheel and screw type, which operates the brakes on all the wheels, are provided for industrial service. Straight system air brakes may be furnished, and also Westinghouse automatic air brakes for railroad service. The sanders are air operated. The cab of the 56½-in. gage locomotive is 11 ft. high and 10 ft. wide, permitting vision along the side of the train as well as over the top of gondola or industrial cars. The capacity based on the normal draw bar pull of ¼ weight of locomotive is 9000 lb. On clean dry rails, under varying conditions of cars and track, developing frictional resistance of 30 to 10 lb. per ton of load handled, the capacity is: Level, 285 to 885 tons; 1 per cent grade, 160 to 285 tons; 5 per cent grade, 50 to 65 tons.

The Ford Motor Co. had decided not to proceed with the construction of the plant near Antwerp, Belgium, according to *L'Usine*, of Paris. The working staff which has been engaged up to date will be dismissed. The decision appears to be the result of a new Belgian tariff, which places severe charges on manufactured pieces imported into Belgium.

Combination Vise and Drill Table for Use with Radial Drills

The combination drill table and vise of the Modern Machine Tool Co., Jackson, Mich., which was described in THE IRON AGE of Jan. 18, 1923, is now available mounted on a pedestal for use with radial drills. The pedestal may be set on the side of the base of the



Drill Table and Vise Combination, With Pedestal for Use With Radial Drills. The arrangement is intended to take care of work usually done on a box table and at the same time to include the advantages of a combination table and vise

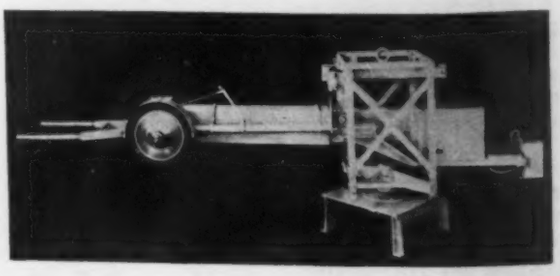
radial drill, placed directly on the base, or mounted on an independent foundation at the side of the column.

When opened, the vise forms a split table and work with projections may be placed in the vise. A small opening of the vise forms a Vee across the table for drilling shafts and other round work. If necessary, the work may extend below the face of the vise to the base of the column. The vise jaws are faced with machine steel and are interchangeable. Hardened jaws may be furnished if required. The vise screw is 1¼ in. in diameter, four threads to the inch, and operates in a bronze nut. The table has four Tee slots and is machined for accurate work.

Two sizes of the combination vise and table are available, one of which is 16 in. in diameter with the table closed, and the other 19 in. in diameter. The jaw opening is 8 in. and 10 in. respectively.

New Portable Swing-Frame Grinder

A portable swing frame grinder arranged to revolve on its base through a complete circle and intended for rough grinding work in steel foundries and billet mills has been brought out by the Farrell-Cheek Steel Foun-



dry Co., Sandusky, Ohio. The machine is equipped with dust-proof roller bearings. The grinding wheel is located outside of the bearing housings, as shown in the accompanying illustration, and is driven by a ball-bearing motor. The motor, belt and starter are entirely inclosed to prevent the entrance of foreign matter. Alemite lubrication is employed throughout. The machine is started and stopped by means of a push button, which is conveniently located.

Would Check Waste by Preventing Booms

Secretary Hoover and President Grant Address National Distribution Conference—Country-Wide Investigation to Be Made

WASHINGTON, Jan. 20.—The National Distribution Conference of the Chamber of Commerce of the United States last week set up machinery for carrying on a country-wide investigation of the processes of merchandising and producing. The scope of the inquiry covers a wide range and is to be carried on by six prominent committees, each covering a different phase of the general problem. Five permanent chairman were appointed to take charge of the work. By special resolution the conference requested Secretary Hoover to designate the members of the Committee on Business Statistics, for the chairmanship of which it is understood Owen D. Young is under consideration.

A far-reaching task was outlined by the conference for the investigating committee which will take up the work in detail. This includes a survey of existing statistical sources and suggestions for a clearing house of statistical information to obviate duplication by various trade associations; the analysis of trade practices and the devising of methods for correcting defects and the determination of the proper functions of the various agencies of distribution now in existence.

Secretary Hoover Commended

The conference adopted resolutions commending the efforts of Secretary Hoover to reduce waste arising from distribution. He discussed the subject in an interesting address before the conference. He declared that he believed the margin between farmer and manufacturing producers on one side and consumers on the other side can be reduced without reduction of wages or legitimate profits and that this would make the greatest contribution to the improvement of the position of farmers and at the same time contribute to lowered costs of living. He asserted that these possibilities lie in the elimination of waste and voluntary cooperation in industry and commerce without governmental regulation. He expressed the opinion that it can be expedited by an extension of the friendly assistance of the Government agencies in organization and information. Mr. Hoover declared that the work of the Department of Commerce during the last three years has demonstrated that there is a vast importance to wastes, 15 of which he specifically set forth. He added that he was disposed to agree with a recent report of the Engineering Council that these wastes amount in many lines to 25 or 30 per cent of the cost paid by the consumer or producer of raw materials. He repeated that he did not believe the remedy lies in legislation except insofar as the Government may speculate and assist citizens to better organize and in furnishing them with fundamental information which assists in the whole question.

Would Not Abrogate Sherman Act

At this point the Secretary said: "Nor am I talking about abrogating the Sherman act. I have no patience with those who deliberately try to confuse these efforts at cooperation in waste elimination with price fixing and restraint of trade. Any intelligent person who has the patience to read and think these problems through and the methods we have developed for their correction will find these efforts to be in the interest of public welfare, and free from trade restraint. They are, in fact, the foundations of real competition."

Mr. Hoover discussed both the theory and the practice in the work of the Department of Commerce as a sort of economic laboratory, during the last three years. In dealing with the question of statistics he declared that it is a truism to say that no individual business enterprise could succeed or be conducted without waste if it does not know accurately its stocks, the volume of output or sales, the rate of stock turnover, or its orders, or the prices, assets and liabilities and the relation of these to previous periods. Neither can business or a trade as a whole, or the nation itself, function efficiently unless it knows these very things.

How Waste Might Have Been Reduced

Mr. Hoover also referred interestingly to the question of inflation and deflation which has become an exceedingly important subject with the stimulation of industry. The Secretary asserted that gigantic wastes from the boom of 1920 through the depreciation in value of excessive stocks, would have been much reduced if there had been more complete information as to the volume of these stocks.

"The fact is," Mr. Hoover stated, "that the greatest waste of all our economic system is the periodic inflationary boom and its consequent ensuing slump with all the speculation, unemployment and extravagance, for without boom there is no slump. The correction of this waste lies in the prevention of booms. No sensible business man wants either boom or slump. He wants stability. Our working folk should dread a boom above all things because it means an afterclap of unemployment and misery. Our farmers should resent a boom more than anything else that can happen in our economic system because it means that they will inevitably get the worst of the deflation which follows. Stability or instability in production and distribution is largely the result of the collective judgment of the trades. They cannot form a right judgment unless they know the facts as to their own business and as to the trade as a whole. Furthermore, they must also know the probable trend of business in general as indicated by the movement in other trades."

Greatest Preventative of Speculation

"Solemn statistics are the greatest preventative of speculation and profiteering ever invented," Mr. Hoover said. The Government can do much in the collection and distribution of statistical information, it was declared, and the Department of Commerce has greatly improved and expanded these services, but it was pointed out that there is still need for improvement. At the same time it was asserted that a considerable part of the statistical service can be better provided by the trades themselves than by the Government.

At this point the Secretary said:

"Right here some tormentors of progress will rise to say that the collection of statistics by the trades may be used to flimflam the public. They can be so used. They have been so used. Likewise automobiles have been used for purposes of bootlegging, but it is not necessary to suppress the use of automobiles on this account, nor is it necessary to allow them bootlegging privileges.

"There is a phase of statistical service that has not been fully studied or fully explored, to which I trust this meeting will give thought. We are almost wholly lacking in the basic data as to distribution. We know our production in most important lines of activity. We know a great deal about stocks of commodities in the hands of producers. We know very little as to stocks in the hands of consumers, the area of distribution in any commodity. If we had a census of distribution, I am convinced that this information would automatically eliminate a great amount of waste in the whole distribution machinery. High pressure selling and marketing expenditure in unprofitable areas is a national waste. We do not know where these areas are."

Next to statistics as a power to eliminate waste,

come standards, Secretary Hoover said, and he at some length discussed accomplishments of the Department of Commerce in aiding industry and setting up standards. Dealing with trade ethics, Mr. Hoover said that there had been a marked advance in the last two decades in the field of business ethics and that it had been due to the efforts of the better trade associations. He urged more education so as to bring about improved efficiency in distribution.

President Grant's Address

In his address to the conference, President Richard F. Grant, of the chamber, declared that studies of costs and methods of distribution are being conducted in many trades, but that many difficulties are experienced in broadening this work and making it effective.

"The distribution problem offers a field for study and discussion which is so broad that only features of the landscape can be recognized," he declared. "It is self-evident that the distribution of steel is wholly different from the distribution of dry goods and the channel followed by a safety razor is quite different from that through which a pound of coffee is conveyed. Nevertheless, you will find, I believe, numerous points of contact which permit a common study and a solution appropriate to all classes of distributors; and to discover these meeting points may be one of the most important results of your work."

IN RECEIVER'S HANDS

Struthers Furnace Company's Financial Troubles Culminate in Appointment of Hugh W. Grant

YOUNGSTOWN, Jan. 20.—Following a hearing last week the Struthers Furnace Co. of New York, operating a merchant blast furnace at Struthers, Ohio, adjoining this city in Mahoning County, was placed in receivership yesterday. According to attorneys for the petitioners, the company is indebted to the extent of $3,500,000. Hugh W. Grant, president of the City Trust & Savings Bank, this city, was appointed receiver. Mr. Grant stated he had not conferred with interested parties and did not know what procedure would be followed with respect to the property.

The receivership followed an action instituted in Mahoning County courts by the Guardian Savings & Trust Co., Cleveland, to foreclose on the company's properties. The bank seeks judgment of $1,560,000, representing face value of $1,500,000 of 8 per cent, first mortgage bonds, and $60,000 interest due, on which the company defaulted payment Nov. 1 last.

Coincident with the litigation instituted by the bank, L. S. Baldwin of Struthers, a stockholder who has been the furnace company's plant superintendent for many years, filed a formal petition asking that a receiver be appointed to manage the company's affairs. In addition to admitting the claim of the Guardian bank, the petitioner cited that the furnace company has other debts aggregating $2,072,710.

The furnace company failed to meet its semi-annual interest payment on bonds due Nov. 1 last and two extensions were granted, the last one expiring Jan. 1. Bondholders then formed a protective committee.

The company's property includes 23 acres of valuable industrial and railroad land at Struthers, adjoining holdings of the Youngstown Sheet & Tube Co.; a modern blast furnace, originally built in 1854, and one of the oldest in the Mahoning Valley, but remodeled and modernized from time to time; half interest in the Wade and Helmar iron ore mines in the Lake Superior ore region, containing about 3,000,000 tons of ore; stock of various materials and between 70,000 and 80,000 tons of pig iron. The company has recently been selling some of this iron, which originally consisted of 70,000 tons of foundry grades and 10,000 tons of basic.

Its financial difficulties are a direct outcome of the slump in the iron industry last year, and reflect to some extent the disadvantages under which merchant iron interests are operating. For a time it was thought that the company's problems might be solved, owing to improvement in the iron trade, and receivership avoided.

The company's principal offices were moved several years ago from Cleveland to New York; branch sales offices are maintained in Pittsburgh. W. C. Runyon is president and the leading interest in the company.

Foundry Subjects to Be Discussed at Ceramic Meeting

The annual meeting of the American Ceramic Society will be held at Ohio State University, Feb. 16 to 21, in connection with the national celebration of the thirtieth anniversary of the beginning of ceramic education in America. There will be a foundry symposium under the direction of Dr. Dorsey A. Lyon. Papers announced are the following:

"The Manufacture and Properties of Cupola Blocks," by I. A. Kruson and J. H. Kruson.

"Refractory Requirements in a Gray Iron Foundry," by Dr. Richard Moldenke.

"Conditions in Cupola Practice that accounts for variable Service In Refractory Blocks," by James T. MacKenzie.

"Principal Refractory Problems of the Malleable Cast Iron Foundry," by H. A. Schwartz.

"Principal Refractory Problems of the Steel Industry," by Schroeder.

An extended program has also been arranged on refractories.

Task of Business Associations

Some general observations on association activities were made by Secretary of Commerce Herbert Hoover in an address on Jan. 12 in Washington before the Associated General Contractors of America. He said he would like to see some association develop a code of ethics that will not only cover the problems of their own interprofessional relations, but will cover their relations to the public at large.

"I am convinced," he said, "that we are indeed in a transitional period in our whole economic fabric, a period proceeding from extreme individualism to a period of necessary associational activities; and the development of these associational activities in a form that will preserve the initiative of every individual, that will keep our nation free from the extension of law and regulation, that will correct the errors in our newly developed system by self-government within our industry, is the greatest mission that can be performed by American business today."

Rulings on Pig Iron Rates

WASHINGTON, Jan. 20.—The Interstate Commerce Commission held not justified proposed increases in rates on pig iron from Chicago and St. Louis producing groups to points in Iowa, but at the same time justified slight decreases in rates from St. Louis to Waterloo, Waverly and McIntire, Iowa. The latter were proposed as an alternative and are subject to a minimum weight of 60,000 lb., marked car capacity to govern when less than the minimum. Indicative of the proposed increases was the suggested rate of $2.80 per ton from Chicago to Cedar Rapids, Iowa, instead of the present rate of $2.31.

A 600-ft. freight boat which was built for the Pioneer Steamship Co., of which Hutchinson & Co. are managers, was launched at the Lorain yard of the American Shipbuilding Co. Jan. 17 and was christened the Philip D. Block, being named for the president of the Inland Steel Co., Chicago.

European Markets Improve in Spots

Export Business Quiet—Franco-German Negotiations Still Continue—German Prices Higher—Belgian Furnaces Active

(*By Cablegram*)

LONDON, ENGLAND, Jan. 19.

PIG iron is easier on account of decreased sales to domestic consumers and poor export demand. Consumers are disinclined to enter into forward contracts, owing to uncertainties with regard to future prices. In consequence, the chances of increasing output are more remote. Hematite is dull because of the continued absence of a revival in demand for steel.

Foreign ore generally is quiet, but America is inquiring for 150,000 tons of Spanish ore. Sellers of Bilbao Rubio ask 22s. 6d. to 22s. 9d. ($5.39 to $5.45) c.i.f. Tees.

Finished steel is quiet, although there are signs of expansion in inquiry in some branches. Makers generally are not eager sellers for forward delivery at current rates.

Sheets and Tin Plate

Tin plate demand is improving, although the turned-over steel is not in important volume. The decision has been reached to curtail output by closing all mills from Friday night until Tuesday morning of each week until the end of February. As a result, several works now are fully booked until the end of February.

Galvanized sheets are firm on recent good sales to India and other markets. Makers, being well pleased, are asking higher prices.

Black sheets are stagnant and prices unchanged.

On the Continent of Europe

Continental position is firmer, with an upward tendency. The Far East is inquiring for good tonnages of all kinds of material. Japan has bought several thousand tons of wire. Germany has sold galvanized wire at £11 5s. (2.39c. per lb.) basis, f.o.b. There is some Indian demand, but purchasers are reluctant to pay makers' prices. The works apparently are well booked for some weeks.

Considerable uncertainty obtains in France as to the effect on the French market if Germany ultimately refuses to admit Lorraine and Sarre steel, which would leave French steel masters with a surplus output. Franco-German negotiations are still proceeding.

GERMAN STEEL PRICES ADVANCE

Bars and Sheets Go Up About 6 Per Cent in Two Weeks—Ingots Now 107 Marks

(*By Radiogram*)

BERLIN, GERMANY, Jan. 19.—Steel ingots have been pegged at 107 gold marks per metric ton. (This represents $28.31 per gross ton.) Steel bars have been advanced to 140 marks per ton (1.51c. per lb.), compared with 132 marks and 1.43c. on Jan. 5. Thin steel sheets have gone up to 230 marks per ton (2.49c. per lb.), compared with 220 marks and 2.39c. two weeks ago.

British Iron and Steel Quiet Over Holidays, but Better Tone Followed Resumption

LONDON, ENGLAND, Jan. 8.—Most of the last two weeks in this country has been one of idleness, so far as business is concerned, owing to the holidays both here and in Scotland. Since the resumption a rather better tone has set in, and some good sales of pig iron have been made for deliveries ranging up to and beyond the first half of the year. This has proved a benefit to producers, who, at the end of the holidays, found themselves with substantial stocks on hand, but stocks of foundry grades now have disappeared and the market has a steadier tone. There is still, however, little sign of life in the export markets, only one or two fair-sized inquiries having come in from the Continent and,

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British and Continental prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at $4.78 per £1, as follows:

Durham coke, del'd..	£1	4½s.	to £1	5s.	$5.86	to	$5.98
Bilbao Rubio ore†...	1	4			5.74		
Cleveland No. 1 fdy..	4	5			20.32		
Cleveland No. 3 fdy..	4	0			19.12		
Cleveland No. 4 fdy..	3	19			18.88		
Cleveland No. 4 forge	3	18½			18.76		
Cleveland basic	4	0			19.12		
East Coast mixed....	4	7			20.79		
East Coast hematite..	4	19	to 5	0	23.66	to	23.90
Ferromanganese	15	0	to 15	5	71.70	to	72.90
*Ferromanganese ...	15	0	to 15	5	71.70	to	72.90
Rails, 60 lb. and up..	8	10	to 9	0	40.63	to	43.02
Billets	7	0	to 8	0	33.46	to	38.24
Sheet and tin plate bars, Welsh	8	7½			40.03		
Tin plates, base box..	1	3½			5.62		
					C. per Lb.		
Ship plates	9	0	to 9	10	1.92	to	2.03
Boiler plates	13	0	to 13	10	2.77	to	2.88
Tees	9	0	to 9	10	1.95	to	2.05
Channels	8	5	to 8	15	1.79	to	1.89
Beams	8	0	to 8	10	1.72	to	1.84
Round bars, ¾ to 3 in.	9	5	to 9	15	2.00	to	2.11
Galv. sheets, 24 gage	17	5	to 17	10	3.63	to	3.73
Black sheets, 24 gage	12	10	to 12	15	2.67	to	2.72
Black sheets, Japanese specifications	15	5			2.25		
Steel hoops	10	15	and 12	10*	2.29	and	2.67*
Cold rolled steel strip, 20 gage	16	0			3.41		

*Export price.
†Ex-ship, Tees, nominal.

Continental Prices, All F. O. B. Channel Ports

Foundry pig iron:(a)								
Belgium	£3	15s.	to £3	16s.	$17.93	to	$18.16
France	3	15	to 3	16	17.93	to	18.16
Luxemburg	3	15	to 3	16	17.93	to	18.16
Basic pig iron:(a)								
Belgium	3	14	to 3	15	17.69	to	17.93
France	3	14	to 3	15	17.69	to	17.93
Luxemburg	3	14	to 3	15	17.69	to	17.93
Billets:(a)								
Belgium	5	10			26.29		
France	5	10			26.29		
Merchant bars:					C. per Lb.		
Belgium	6	0			1.28		
Luxemburg	6	0			1.28		
France	6	0			1.28		
Joists (beams):								
Belgium	5	15			1.23		
Luxemburg	5	15			1.23		
France	5	15			1.23		
Angles:								
Belgium	6	2½			1.31		
⅛-in. plates:								
Belgium	7	2½	to 7	7½	1.52	to	1.57
Germany	7	2½	to 7	7½	1.52	to	1.57
⅜-in. ship plates:								
Luxemburg	7	2½	to 7	7½	1.52	to	1.57
Belgium	7	2½	to 7	7½	1.52	to	1.57

(a) Nominal.

until we are shipping anything approaching normal quantities to foreign markets, producers can hardly look for prosperous times. The production of pig iron on the North East Coast last year is estimated at 2,243,700 tons, which is an increase over 1923 of about 126,000 tons, but the total for Great Britain is put at 100,000 tons lower than in the previous twelve months.

Steel Plants Down, Some Permanently

Finished steel has naturally been quiet, even more so than pig iron, as most of the plants have been shut down and are carrying out repairs and so forth, but there seems to be a better tone, especially in the home trade, and it is expected that the Birmingham quarterly meeting, which is being held today, will show some indication as to the future trend of prices.

That English works have been carrying on under difficulty there is no doubt at all, and this is reflected in a statement from the Midlands; George Adams & Sons, Ltd., owners of the Mars Iron Works at Wolverhampton and the Cleveland Iron Works, also at Wolverhampton, which business was founded in 1867, have decided to close down and go out of business, owing to the unsatisfactory trade conditions prevailing.

Shipbuilding Shows Reduction

According to Lloyd's Register, just published, the tonnage under construction at the end of last quarter in Great Britain and Ireland showed a reduction from the previous quarter of 171,000 tons and was about 98,000 tons less than a year ago. Work commenced during the quarter was 194,594 tons, which compares with 252,754 tons during the previous quarter. The total tonnage launched in Great Britain and Ireland last year was 493 vessels, of a gross tonnage of 1,439,624 tons. The world's tonnage launched is put at 897 vessels of 2,178,756 tons, which compares with 701 vessels of 1,643,181 tons in 1923.

Throughout the world the total under construction was 2,470,436 tons, of which Germany and Danzig accounted for 379,044 tons, France 197,170 tons, Italy 154,790 tons, Holland 124,766 tons and Denmark 84,828 tons. There are, at the present time, 50 steamers and motor ships of over 1000 tons each under construction in the world for the carriage of oil in bulk. Of these "tankers" 20 are being built in Great Britain and Ireland, 11 in Germany and 12 in Holland. The motor ships being built in Great Britain at the end of December amounted to 32¾ per cent as much as the steam tonnage.

LUXEMBURG MARKET IMPROVES

Higher Quotations Meeting Buyer Resistance—Early Delivery Less Easy to Obtain

LUXEMBURG, Dec. 24.—A further development of the revival noticed last month has marked the outset of November and, after a long period of quietness, the tendency of the market is distinctly better. Numerous factors have long militated in favor of this improvement: reduction for several months of the world's requirements; tension of foreign exchanges; momentary disappearance of German competition; weak position of numerous plants; very low level of selling prices; result of elections in Great Britain; rail orders from the Belgian State, and, lastly, important buying from Germany.

Nevertheless, a certain resistance has been noticed on the part of buyers, but the iron masters have been able to advance their quotations up to the end of the month under the influence of the revival of the Far Eastern markets. The plants have secured also a few orders from South America, which is getting more active every day. Under such circumstances, the order books have been filled at advantageous rates while delivery dates were getting longer.

Many orders are now being discussed on the market, including the furnishing of freight cars for the Belgian State Railroads and several railroad companies of Great Britain, the supply of rolling stock accessories for Siam, electrical appliances for Norway, bars, barbed and galvanized wires for Bulgaria. The suspension of the Hispano-Belgian customs modus vivendi is putting the Belgian and Luxemburg plants in an awkward position, a good number of orders having been cancelled, and the securing of fresh orders is now practically impossible.

On the other hand, the present activity is rather surprising, the end of the year being usually a calm period. We must wait until Jan. 15 to see what the prospects of the first quarter of 1925 will be. Current prices are as follows: Foundry iron No. 3, 350 to 360 fr. or $17.65 to $18.15 per gross ton; basic, 335 to 345 fr. or $16.90 to $17.40. Semi-finished products: basic ingots, 450 to 460 fr. or $22.70 to $23.20; blooms, 475 to 485 fr. or $23.96 to $24.46; billets, 500 to 510 fr. or $25.22 to $25.73; largets, 525 to 535 fr. or $26.48 to $27. Joists, 525 fr. or 1.18c. per lb; bars, 540 fr. or 1.22c. per lb.; heavy sheets, 660 fr. or 1.49c. per lb.

FRENCH MARKET MARKING TIME

Iron and Steel Prices Due to Rise with Increasing Costs—Export Market Moderately Active

PARIS, FRANCE, Jan. 9.—A holiday atmosphere still prevails and not much has been felt of the slight amelioration recorded on the Belgian market. We have a good many reasons to believe, however, in a not distant increase in prices, due to rising freight charges, to the dearness of money and to the strict inforcement of the 8-hr. day, factors which undeniably will raise production costs. There are some depressing factors which must, on the other hand, be accounted for, that is, the slackening of activity in the reconstitution of war-damaged regions, the revival of German competition on the export markets and the uneasiness caused by our political situation.

Coke.—During December the ORCA was supplied with 338,056 tons of coke, a daily average of 10,900 tons. For the first six days of January the arrivals were 56,887 tons (9500 tons a day). The French Government has given up momentarily the idea of charging consumers with the actual price of coke as paid through the Transfer Committee to the German cokeries and mines; the price of coke will, therefore, be maintained on its present level until further notice.

Pig Iron.—At home the activity is a little subdued, while export transactions continue numerous. There are few available supplies. The ruling quotation for No. 3 PL remains at 310 fr. ($17 per gross ton), with a few francs reduction for large contracts. Producers refuse to quote under 305 fr. ($16.73) and higher rates have little success with the clientèle. Prices of hematite vary according to region: they stand at 400 fr. ($21.95) in the Center (Chasse, Givors, Decazeville, Ariège), at 410 to 415 fr. ($22.50 to $22.77) in the East; 420 to 425 fr. ($23.04 to $23.31) in the North. At such rates British competition is practically impossible.

Ferroalloys.—Prices of ferrosilicon are sustained; they stand at 870 fr. for 25 per cent ($47.73); 1120 fr. for 45 per cent ($61.45); 1930 fr. for 75 per cent ($105.90); 2630 fr. for 90 per cent ($144.30). Ferrochromium is worth 2750 fr. for 2.4 per cent ($150.87); 2030 fr. for 4.6 per cent ($111.39); 1980 fr. for 6.8 per cent ($108.60); 1920 fr. for 8.1 per cent ($105.30). Silico-spiegel, 880 fr. ($48.27); silico-manganese, 1610 fr. for 20 to 25 and 50 to 55 per cent ($88.32); silico-manganese, 20 to 25 and 60 to 65 per cent, 1730 fr. ($94.90). Producers of ferromanganese refuse to enter any commitments on account of the impending increase in freight charges and customs dues. The ruling quotations are 1500 to 1550 fr. per ton ($82.30 to $85.03) delivered; the British parity being £15 10s., delivered, customs charges paid.

Semi-Finished Products.—Inland and foreign competition has a large influence on prices; they are now easier at 390 to 400 fr. ($21.39 to $21.95) for ingots; 410 to 420 fr. (22.50 to $23.04) for blooms; 430 to 440 fr. ($23.60 to $24.14) for billets; 450 to 460 fr. ($24.69

to $25.23) for largets. The export quotations are: £4 18s. 6d. to £5 1s. 6d. ($23.54 to $24.26) for blooms; £5 2s. 6d. to £5 6s. ($24.50 to $25.33) for billets; £5 7s. 6d. to £5 10s. ($25.69 to $26.29) for largets.

Rolled Steels.—This is a dull section, the level of bookings is low and delivery times reduced. Competition is again active. There are still interesting transactions for export, the prices of steel bars have appreciated; they stand around £5 18s. 6d. to £6 (1.26c. to 1.28c. per lb.); the price of beams is £5 10s. to £5 12s. 6d. (1.17c. to 1.20c.). Inland quotations are maintained at 500 to 530 fr. (1.22c. to 1.30c.); and 460 to 480 fr. (1.13c. to 1.18c.) respectively. Merchant irons are are quiet but firm; puddlage irons and round irons for bolts are worth 63 to 65 fr. (1.54c to 1.59c. per lb.) basis; merchant irons, 56 fr. (1.37c.); high-grade irons, No. 3, 90 fr. (2.20c.). In spite of the large contracts booked for export, prices for rails have reached low levels, and the reconstitution of a selling comptoir is seriously considered.

Plates and Sheets.—The market is quiet. Heavy and light sheets are easier. The prices currently applied on the inland market are as follows: large flats, 630 to 650 fr. (1.54c. to 1.59c.); heavy sheets, 650 to 680 fr. (1.59c. to 1.67c.); medium sheets, 875 to 975 fr. (2.14c. to 2.39c.); light sheets, 1000 to 1100 fr. (2.45c. to 2.69c.); heavy sheets at export are offered at £6 17s. 6d. (1.47c.); medium sheets, 3mm. or No. 11½ gage, £7 10s. (1.60c.).

Foundry.—The activity of the pattern foundry trade has greatly lessened, and competition is sharp.

BELGIAN IRON AND STEEL FIRM

Fifty Furnaces Out of 56 Are in Operation—Trading Quiet with Few Price Changes

BRUSSELS, BELGIUM, Jan. 8.—The year begins under favorable auspices. The firmness registered during the last fortnight is wholly maintained; demand is satisfactory, although rather limited, but is higher than usual at this time of the year. The rise of prices has brought a certain resistance on the part of buyers, but not generally. On the other hand, the bookings in shapes and sheets in the plants are increased through the adjudication of 3400 freight cars for the Belgian State Railroads.

Export demand also is active. The market is under the impression that important contracts are held off until Jan. 15, when the definite tendencies of the market will be known. It will be remarked that, contrary to December last, finished steels and irons have improved, while pig iron and semi-finished products are unsettled.

Pig Iron.—Demand is satisfactory, but prices are easier at 355 to 365 fr. ($18.02 to $18.53) f.o.b. Antwerp. Basic irons are very much discussed around 340 to 350 fr. ($17.25 to $17.76); the producers complain of the high price of coke in respect to coking smalls. Luxemburg plants quote the same prices as the Belgians; the Lorraine iron masters are ready to grant concessions.

Semi-Finished Products.—The market is irregular, but steady; the British consent to deal at low prices only. The rates of the Belgian plants are about equal to those of the Lorraine and Luxemburg works. Inland quotations are: basic blooms, 485 to 495 fr. ($24.62 to $25.13); billets, 510 to 520 fr. ($25.89 to $26.39); largets, 520 to 530 fr. ($26.39 to $26.90). Export prices: blooms, £5 to £5 1s. 6d. ($23.90 to $24.25); billets, £5 2s. 6d. to £5 6s. ($24.50 to $25.33); largets, £5 7s. to £5 10s. ($25.57 to $26.29).

Irons.—Producers are trying to stabilize the market at present rates, but have been unsuccessful, as the current of trade leaves much to be desired; quotations are easier. Export dealings are made on the basis of £6 7s. 6d. ($30.47) f.o.b. Antwerp, or 590 to 600 fr. ($29.95 to $30.45); inland, it is difficult to deal under 600 fr. for high-grade irons.

Steels.—The slight amelioration noticed during the first fortnight of the year has been wholly confirmed at the last Brussels Bourse, although trading is quiet. Inland rates for beams are 560 to 570 fr. (1.27c. to 1.29c. per lb.); steel bars, 580 to 590 fr. (1.31c. to 1.34c.). General export transactions stand at £5 12s. 6d. to £5 15s. (1.20c. to 1.23c.) for beams; £5 18s. 6d. to £6 (1.26c. to 1.28c.) for bars. Wire rod is worth 660 fr. ($33.50) inland, £6 15s. to £6 17s. 6d. export ($32.27 to $32.86) export; hoops, 780 to 800 fr. (1.77c. to 1.81c.) inland.

Plates and Sheets.—The market is firm and shows an upward tendency for certain grades; the current of orders is satisfactory. Producers generally are well booked ahead and at advantageous prices. Inland rate for heavy sheet is between 675 and 685 fr. (1.53c. and 1.55c.); the export quotations, £7 (1.49c) and even £7 12s. 6d. (1.63c.). Light and medium sheets are firm; the ⅛-in. grade has been dealt in at £7 12s. 6d. (1.63c.) f.o.b. Antwerp.

Scrap.—Upward tendency, at least nominally, as the market is quite dull; open-hearth scrap is worth 310 to 320 fr. ($15.73 to $16.24); blast-furnace, 280 to 290 fr. ($14.20 to $14.72); shavings, 230 to 240 fr. ($11.67 to $12.18); machinery, first choice, 340 to 370 fr. ($17.25 to $18.78).

Furnaces in Blast

On Jan. 1 the number of furnaces in blast in Belgium was 50, and 6 out of blast, of the 56 in existence, or exactly the same number as on Jan. 1, 1924, and one more than in January, 1913. The average daily production is 325 tons of foundry iron and 8590 tons of basic iron.

IMPROVED SITUATION IN CHINA

Iron and Steel and Non-Ferrous Metals Moving Well—Restricted Credit Is a Damper

SHANGHAI, CHINA.—While the iron and steel market has its dull spots, business shows considerable improvement and cargo is moving out more easily than before. This is not confined to any special lines but is general. There is some buying for next year's delivery of bars, angles, joists, etc.

The attitude of the native banks in restricting credit is interfering with the easy flow of cargo into the interior. It is believed that the native banks after the Chinese New Year will extend credit to Chinese merchants, and until then no big changes are looked for in the local market. There is an improvement in wire nails with prices around Taels 4 per keg. Supplies are going out fairly actively, and the same remark applies in the case of galvanized sheets. Stocks of galvanized sheets are not considered heavy at the present moment. Prices are unchanged.

Non-Ferrous Metals

The London metals market is better, with Germany doing more buying of wire rods and England making large purchases of steel. Total stocks of tin at the end of November in London stood at 4605 tons, or slightly higher than at the end of October, when stocks in the warehouses were estimated at 4394 tons.

There is a small business passing in Yunnan tin, the buyers being the Shaoshing dealers.

Local prices for iron and steel and other metals are:

	Taels Per Picul	
Copper ingots (Jap.)	25.50 or	14.7c. per lb.*
Brass rods (Jap.)	25.50 or	14.7c. per lb.
Bamboo steels, ½ to 1 in.	5.00 or	2.88c. per lb.
Wire nails, countersunk, checkered (per keg)	4.00 or	$3.08 per keg
Lead bars, B. H. P.	14.00 or	8.07c. per lb.
Tin plate, plain, 90 lb. (Br.) (per case)	7.90 or	$6.08 per case
Zinc sheets, Nos. 9 to 10	16.00 or	9.23c. per lb.
Mild steel round bars, ⅜ to 1¼ in.	3.10 or	1.79c. per lb.
Tin in slabs (Singapore)	95.00 or	54.80c. per lb.
Antimony regulus (Hunan)	290.00 or	167.3c. per lb.
Pig iron, "Han-Yen-Ping" (per metric ton)	36.00 or	$28.16 per gross ton

*At 77c. per Haikwan tael.

Unfilled Sheet Orders Gained Materially in December

An interesting feature of the monthly statistical report of the National Association of Sheet and Tin Plate Manufacturers is an increase in the number of hot mills in the United States as compared with the previous months. The total number of hot mills now is 701, compared with 686 the total reached in April last year and 679 at the beginning of 1924.

Shipments of sheets in December ran 10,345 tons ahead of those for the previous month and about equaled those of October. December sales, though about 112,000 tons less than in November, were 91,000 tons in excess of production and 121,000 tons more than shipments and partly explain an increase in the unfilled orders during December of almost 132,000 tons. The difference between sales and shipments should measure the gain in unfilled orders, but adding the increase in unshipped orders of 9000 tons and allowing for the increased number of mills now embraced by the report and the gain as reported is understood.

December sales were 111.6 per cent of the capacity represented in the report; production 82.6 per cent; shipments 73.0 per cent; unfilled orders 211 per cent; unshipped orders 27.3 per cent and unsold stocks 14.5 per cent.

The report for December, compared with the two preceding months and December, 1923, figures in net tons, follows:

	1924			December,
	December	November	October	1923
No. of mills	701	686	686	674
*Capacity, total	422,600	384,000	431,000	378,000
Capacity reporting	315,500	282,300	312,900	263,900
Sales	350,868	462,709	221,773	348,446
Production	259,794	224,931	247,222	115,229
Shipments	229,573	219,228	229,771	188,600
Unfilled orders	663,460	531,845	275,953	445,167
Unshipped orders	85,856	76,811	75,862	59,916
Unsold stocks	45,743	41,573	42,685	44,146

*Based on possible number of working turns.

Sales, production and shipments by months for 1924, compiled from the monthly reports, make the following showing:

	Sales	Production	Shipments
January	234,858	274,097	228,660
February	189,081	275,118	249,859
March	251,411	278,767	262,497
April	182,903	234,000	235,967
May	126,487	176,582	196,254
June	108,693	114,807	141,176
July	135,998	144,291	151,255
August	207,986	190,436	177,498
September	227,520	217,981	190,210
October	221,773	247,222	229,771
November	462,700	224,931	219,228
December	350,868	259,794	229,573
Totals	2,700,278	2,638,026	2,511,948

Annual Dinner of New England Foundrymen's Association

Approximately 175 members and guests attended the twenty-ninth annual dinner of the New England Foundrymen's Association, at the Exchange Club, Boston, Wednesday evening, Jan. 14. The International Molding Machine Co., Chicago, was admitted to membership. The report of Fred F. Stockwell, Barbour-Stockwell Co., Cambridge, Mass., secretary, showed a membership as of Jan. 1 of 186, contrasted with 187 a year previous. The association is in excellent financial condition. Officers elected for the new year were: R. F. Harrington, Hunt-Spiller Mfg. Corporation, South Boston, president; H. P. Blumenauer, Arcade Malleable Iron Co., Worcester, Mass., vice-president; George H. Gibby, Gibby Foundry Co., East Boston, was reelected treasurer; and Mr. Stockwell, secretary.

Thomas I. Curtin, Waltham Foundry Co., Waltham, Mass., was added to the executive committee, the other members being H. S. Chaffee, Builders Iron Foundry, Providence, R. I.; Thomas E. Officer, Sullivan Machinery Co., Claremont, N. H.; Carl H. Neunan, Union Mfg. Co., New Britain, Conn.; and Charles A. Reed, Reed, Fears & Miller, Inc., Boston. Following the election of the officers, Norman Russell, the retiring president, turned the meeting over to Mr. Harrington. Prof. G. W. Dyer, department of social science, Vanderbilt University, Nashville, Tenn. was the guest of the evening. He gave a stirring address on the responsibility of leadership. Charles A. Reed was chairman of the committee of arrangements.

German Labor Agitates for Short Day

WASHINGTON, Jan. 20.—Agitation for the legal reintroduction of the 8-hr. day is being engaged in generally by German labor, says Commercial Attaché Herring, Berlin, in a cablegram to the Department of Commerce. Four unions of miners in the rural district and of Berlin metal workers have officially refused to renew agreements for a longer working day next month. German metal workers, who comprise the largest group of organized labor, have reported that 9.2 per cent of their membership was totally unemployed and 7.34 per cent were working only part time in early December, against 13.45 per cent totally unemployed and 14.5 per cent working only part time in early November. The cablegram states, however, that there has been an increase from 437,000 persons receiving government doles on Dec. 1, to 458,000 on Dec. 15.

Drop Forging Plant Expands

The Endicott Forging & Mfg. Co., Inc., maker of drop forgings, Endicott, N. Y., is enlarging its facilities. A brick building, 50 x 130 ft. in size, is under construction for heat treating and die storage, and a contract has just been let for a 55 x 96 ft. steel addition to the company's present forge shop. Three heat treating furnaces have been purchased for the new building and the Binghamton Foundry & Construction Co. will supply the steel work for the die storage racks. In the forge shop addition the plan is to install two or three board hammers. The addition will require $50,000 to $60,000 for building and equipment.

Simplification Plans Progressing

WASHINGTON, Jan. 20.—The Association of State Highway Officials has endorsed the re-enforcing steel bar simplification program which had been recommended as a result of conferences between the Division of Simplified Practice, Department of Commerce, and manufacturers, distributors and consumers. With the indorsement of the association this exceeds the 80 per cent of each group whose indorsement is required in order to put the program into effect.

The division also has announced that there have been sufficient experiences from steel mills, distributors and consumers to justify the statement that the sheet steel simplification program has been accepted by the entire industry.

Shippers to Meet in Terre Haute

A meeting of the Midwest Regional Advisory Board has been called for Jan. 23 at the Hotel Deming, Terre Haute, Ind. The board is an organization of shippers in Illinois, Indiana, Iowa and Wisconsin and this is its fourth meeting. It is accomplishing much in bringing railroads and shippers together on a cooperatve basis for settlement of disputes and controversies, elimination of car shortage and promoting the welfare of shippers throughout the territory.

Domestic sales of oak leather belting reported by the Leather Belting Exchange for December show an aggregate of 324,263 lb., valued at $547,681, or an average of $1.69 per lb. This compares with November figures of 302,794 lb., valued at $514,750, or an average of $1.70 per lb. In December, 1923, the sales were 320,547 lb., valued at $558,393, or an average of $1.74 per lb.

Operations Near Capacity Rate in Mahoning and Shenango Valleys

YOUNGSTOWN, Jan. 19.—Iron and steel production in the Mahoning and Shenango Valleys approximates, at least, a capacity rate, with some deflections of course.

The Youngstown Sheet & Tube Co. has added another open-hearth furnace to its active units, for a total of 22 melting, of 24. Steel ingot output is at the highest rate in more than a year, with 48 of 52 independent open-hearths melting and 28 of 30 Steel Corporation units fired. All four Bessemer plants in the district are active, those of the Sheet & Tube company at East Youngstown, and the Carnegie Steel Co. at the Ohio works, Youngstown, and at New Castle, Pa., close to capacity, with the Bessemer plant of the Republic Iron & Steel Co. at Youngstown at 70 per cent.

The Republic company has been obliged to bank No. 1 blast furnace in its Haselton group for repairs, and the stack will be inactive for several weeks. Offsetting this loss, however, is the resumption by the Sheet & Tube company of its Tod furnace in the Brier Hill group, leaving the district total at 32 active, of 45. With its Jeannette stack at the Brier Hill plant to blow in shortly, the Sheet & Tube company will be operating all of its furnaces in this territory except one at its Hubbard plant in Trumbull county.

Sheet mill schedules are being well sustained, with 110 units of 127 independent mills in the Mahoning Valley under power; the Sheet & Tube company is operating 25; the Republic company 16; the Newton Steel Co. 14 and the Thomas Sheet Steel Co., 11. Of 33 merchant steel bar, band, hoop and strip mills in the Mahoning Valley, all except one, a light bar mill at the Brown-Bonnell works of the Republic company, are under power.

Tin mill production is being sustained at 88 per cent, with the American Sheet & Tin Plate Co. operating 76 of its 90 mills in this district, and all independent units occupied.

Growth of Harnischfeger Corporation

Like many other large companies the Harnischfeger Corporation, Milwaukee, the name of which was changed recently from the Pawling & Harnischfeger Co., as noted in THE IRON AGE of Dec. 11, 1924, grew from a small beginning.

With ambition and experience in their trades as their principal assets Henry Harnischfeger and Alonzo Pawling entered into a partnership in 1884, starting business in a small one-story shop in Milwaukee. Their shop equipment, which included only a few machine tools, was driven by a small steam engine, insufficient in power to drive both the lathe and planer at the same time. File cutting machines, grain conveyors, carving machines, brick-making machines, bolt clippers, knitting machinery and the Nordberg poppet valve governor were among the machines and other products built in the early days. Two other large companies, the Chain Belt Co., and the Nordberg Mfg. Co., grew up from the products originally built in the small shop of Pawling & Harnischfeger.

The shop gradually expanded, another floor being added and later a three-story extension. The year 1887 is outstanding in the history of the company. The Edward P. Allis Co., now the Allis-Chalmers Mfg. Co., placed A. J. Shaw in charge of the rebuilding of a rope-driven traveling crane in its plant. Mr. Shaw conceived the idea of providing a separate motor for each motion of the crane, namely hoisting, bridge travel and trolley travel, and the crane that was developed is said to be the first three-motor electric traveling crane ever built. Following this the Shaw Electric Crane Co. was formed to manufacture cranes incorporating individual motor drive for each motion, Messrs. Pawling and Harnischfeger being associated with Mr. Shaw in this enterprise. Mr. Harnischfeger was president. Later Mr. Shaw withdrew from the company.

In addition to cranes and hoisting machinery, Pawling & Harnischfeger extended their line to include steam feed engines for saw mills, steam steering gears for ships and special machinery for the brewing industry. Horizontal boring and drilling machines, such as developed for use in their shops, were placed on the market later, and to these were added centering machines and radial wall drills.

The plant continued to expand until the burning of their principal shop in 1903 prompted the management to find a new location and in 1904 the present plant of the company was erected. The partnership was incorporated in 1910 and in the next year Mr. Harnischfeger purchased Mr. Pawling's interest in the business, the latter retiring to care for his private enterprises until his death in May, 1914.

The building of a line of gasoline-driven excavators was begun in 1913; these machines are now being produced at the rate of 25 to 30 a month. In 1923 a new extension of 35,500 sq. ft. was added to the main shops and power house facilities were increased. The Hercules Steel Casting Co., plant was purchased last year.

Detroit Foundrymen's Association Meeting

The desulphurization of cast iron and experimental work with the hot blast cupola held the attention of about 100 members of the Detroit Foundrymen's Association and guests from Almont and Flint, Mich.; Buffalo and Chicago, at the first meeting of the new year held at the Elks Temple, Detroit, Thursday evening, Jan. 15. F. K. Vial, vice-president Griffin Wheel Co., Chicago, was the speaker of the evening and gave the history of the chilled cast iron car wheel from the time of its invention to the present day, showing how it had held its place in railroad equipment as against the many radical changes made in almost all other parts of railroad car assembly. Mr. Vial spoke of existing specifications on car wheels and told of desulphurization methods his company is using in its foundry practice. Further research work in this connection is being carried on by the Car Wheel Manufacturers Association in the direction of controlling the chemical elements of cast iron in the cupola.

General interest was aroused in the discussion of the hot blast cupola as described by the speaker in telling of the Griffin Wheel Co.'s successful use of this method as developed from a German invention. This installation was described in THE IRON AGE, Nov. 22, 1923.

Will Build Tractors at Bessemer Plant

BESSEMER, ALA., Jan. 20.—A plant to manufacture tractors of special design, daily output of 100 being planned, is to be built in this city, 13 miles south of Birmingham, by J. O. Heinze, formerly of the Heinze Electrical Co., Lowell, Mass., and at one time engineer with the General Motors Co. A tract of land of 200 acres has been purchased. Bessemer was selected as the place for the manufacture of the tractors for the reason that raw material is so close, cheap labor obtainable and that practically all-year work is possible.

Woodward Ovens to Be Rebuilt

BIRMINGHAM, ALA., Jan. 19.—Woodward Iron Co. has let contract to the Koppers Co., Pittsburgh, for the rebuilding of 40 of its by-product ovens at Woodward, the ovens to be practically built new. The Woodward company has 230 ovens at this place. The rebuilt ovens will greatly increase the production of coke at this point. The Koppers Co. is completing 25 additional ovens for the Alabama By-Products Corporation and is building 57 by-product ovens for the Republic Iron & Steel Co. in Birmingham.

At the quarterly Board of Administration meeting of the Ohio State Foundrymen's Association held at Cincinnati, Jan. 15, it was decided to hold the annual convention in September, the exact time and place to be determined later. Broadening of the scope of the cost work carried on by the association was also under discussion, as was the insurance situation as it affects the foundry. Simplified practice, which has received much attention, was again discussed, and the directors will have some important recommendations for the membership in the near future.

Iron and Steel Markets

AN ADVANCE AT CHICAGO

One Producer Puts Plates, Shapes and Bars $2 a Ton Higher

At the Same Time Scrap Declines—Operations Somewhat Larger

With no well-defined change in the amount of new buying, there is some increase in the rate of specifying against finished steel contracts. As in the first half of the month, the outstanding feature is still the high rate of mill operations, accompanied by an unimpeded flow of material into all the channels of consumption.

While Chicago recently had a distinct lead in percentage of capacity in operation, the Carnegie Steel Co. and several independents in the Pittsburgh and nearby districts have made gains this month. Carnegie plants are now exceeding the 93 per cent of last week and the Central Western industry as a whole is above 85 per cent.

The first move toward the $2 advance in plates, shapes and bars of which sellers have given out intimations lately was made on Tuesday, Jan. 20, by a Chicago independent, which put plates and shapes at 2.30c., Chicago, and bars at 2.20c. This company opened its books for second quarter business.

To what extent the $2 advance will be adopted by Pittsburgh and other Central Western producers will develop shortly. Meanwhile, if precedent is followed the new prices will be used to stimulate specifications on existing first quarter contracts.

Over against this advance in heavy finished products, a decline this week in scrap prices in all markets is attracting attention. This recession in old material follows a long upward movement, and it remains to be seen how far it is to be taken as a readjustment after an advance more rapid than that in steel.

The railroads continue to make moderate additions to car and rail bookings. The Nickel Plate has bought 22,000 tons of rails, and the long-pending Pennsylvania Railroad contracts for 100,000 tons are expected this week. The New York Central has placed 1000 gondola cars and the Rock Island has come into the market for 1600 freight cars and 10 locomotives.

Swelled by the more than 26,000 tons for the New York Life building, to go up on the site of the Madison Square Garden, New York, fabricated steel bookings for the three weeks of January appear to be at the rate of November and December, or 36,000 tons weekly in sizable structures. Notable among new projects offered for bidding are steel works buildings for the Ford Motor Co. and the McKinney Steel Co.

The Bureau of Census now puts the country's fabricating capacity at 290,000 tons per month and the 1924 buying at 68 per cent of that capacity.

Sheets are not yet free from price irregularities. January specifications have not been of the volume looked for, this being due in part to the caution of automobile companies. Some mills have sold black sheets at 3.50c., though 3.60c. has been regarded as the market.

Strip steel is one product in which excess capacity has been particularly indicated. In cold-rolled strip 4c., Cleveland, has been done, as against 4.15c., which is called regular.

Wire products have been shaded $1 per ton in Western competition.

Lake shipbuilding shows signs of mild revival. Three freighters are being figured on by Lake Erie yards, and a Chicago mill will furnish 3000 tons for a boat to be built at Manitowoc, Wis.

Following the buying of 10,500 tons of Belgian rails by Henry Ford's road, the Interborough Rapid Transit Co., New York, is negotiating with European mills for 5000 tons. A road in Texas and another in Washington have placed small orders abroad.

For the 17-mile line of the Adirondack Light & Power Co., 12-in. Mannesmann pipe will be furnished by a mill in the Saar. Foreign cast iron pipe has been freely offered in this country lately. Two Massachusetts cities, however, awarded their contracts in this country, though the French plant at Pont-au-Mousson was low bidder. More is heard in Eastern markets of European bars for concrete reinforcements, but the rising tendency of costs abroad is emphasized by the decision of the German cabinet to restore the 8-hour shift at coke works and blast-furnaces.

In the South $1 more is being asked for pig iron for delivery in the second quarter of the year than for the first quarter. However, little business has been done at the higher prices, and throughout the Northern States, while furnaces are conservative about selling for second quarter, little effort is being made to obtain higher prices for that delivery. It is difficult to advance quotations owing to the softening of coke prices and the competition of foreign iron. The arrival at Philadelphia in the past week of 5000 tons of French pig iron, 1800 tons of Indian and 1500 tons from the United Kingdom indicates that foreign competition cannot be disregarded.

Pittsburgh

Moderate Increase in Specifications—High Rate of Operations Maintained

PITTSBURGH, Jan. 20.—Reports about specifications against steel contracts still are somewhat mixed, but generally the word is that they show some increase over those of the first two weeks of the year due to the fact that inventories are out of the way and consumers have completed plans for the early part of this year. There has been a particularly notable increase in specifications against wire products, as a result of which makers now see almost capacity operations for at least the next 30 days. In other finished products, with the possible exception of strips, the common report is that buyers are sending along shipping instructions with more freedom than was the case recently.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Jan. 20, 1925	Jan. 13, 1925	Dec. 22, 1924	Jan. 22, 1924
No. 2X, Philadelphia‡	$25.01	$25.01	$25.01	$24.13
No. 2, Valley furnace†	22.50	22.50	22.00	22.50
No. 2, Southern, Cin'ti†	24.05	24.05	24.05	26.05
No. 2, Birmingham, Ala.†	20.00	20.00	20.00	22.00
No. 2 foundry, Chicago*	24.00	24.00	23.00	24.00
Basic, del'd, eastern Pa.	24.25	24.25	23.50	22.75
Basic, Valley furnace	22.00	22.00	21.50	21.00
Valley Bessemer del'd P'gh	24.76	24.76	24.26	24.76
Malleable, Chicago*	24.00	24.00	23.00	24.00
Malleable, Valley	22.50	22.50	22.00	22.50
Gray forge, Pittsburgh	23.76	23.76	23.26	23.26
L. S. charcoal, Chicago	29.04	29.04	29.04	29.15
Ferromanganese, furnace	110.00	110.00	105.00	109.00
Rails, Billets, etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Bess. billets, Pittsburgh	37.00	37.00	36.00	40.00
O.-h. billets, Pittsburgh	38.00	38.00	36.00	40.00
O.-h. sheet bars, P'gh	40.00	39.00	37.00	42.50
Forging billets, base, P'gh	42.50	42.50	42.50	45.00
O.-h. billets, Phila.	41.67	41.67	41.67	45.17
Wire rods, Pittsburgh	48.00	48.00	48.00	51.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb.	2.00	2.00	2.00	2.35
Light rails at mill	1.80	1.80	1.80	2.25
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.28	2.28	2.32	2.62
Iron bars, Chicago	2.00	2.00	2.00	2.40
Steel bars, Pittsburgh	2.10	2.10	2.10	2.40
Steel bars, Chicago	2.10	2.10	2.10	2.50
Steel bars, New York	2.44	2.44	2.44	2.74
Tank plates, Pittsburgh	2.00	2.00	1.90	2.50
Tank plates, Chicago	2.20	2.20	2.20	2.60
Tank plates, New York	2.34	2.34	2.34	2.74
Beams, Pittsburgh	2.10	2.10	2.10	2.50
Beams, Chicago	2.20	2.20	2.20	2.60
Beams, New York	2.34	2.34	2.34	2.74
Steel hoops, Pittsburgh	2.50	2.50	2.50	3.00

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Sheets, Nails and Wire,	Jan. 20, 1925	Jan. 13, 1925	Dec. 22, 1924	Jan. 22, 1924
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh	3.60	3.60	3.60	3.85
Sheets, black, No. 28, Chicago dist. mill	3.70	3.70	3.70	...
Sheets, galv., No. 28, P'gh	4.75	4.75	4.75	5.00
Sheets, galv., No. 28, Chicago dist. mill	4.85	4.85	4.85	...
Sheets, blue, 9 & 10, P'gh	2.70	2.70	2.70	3.00
Sheets, blue, 9 & 10, Chicago dist. mill	2.80	2.80	2.80	...
Wire nails, Pittsburgh	2.85	2.85	2.85	3.00
Wire nails, Chicago dist. mill	2.95	2.95	2.95	...
Plain wire, Pittsburgh	2.60	2.60	2.60	2.75
Plain wire, Chicago dist. mill	2.70	2.70	2.70	...
Barbed wire, galv., P'gh	3.55	3.55	3.55	3.80
Barbed wire, galv., Chicago dist. mill	3.65	3.65	3.65	...
Tin plate, 100 lb. box, P'gh	$5.50	$5.50	$5.50	$5.50
Old Material, Per Gross Ton:				
Carwheels, Chicago	$21.00	$22.50	$21.50	$21.00
Carwheels, Philadelphia	19.50	19.50	19.50	21.00
Heavy steel scrap, P'gh	21.50	22.00	22.00	22.00
Heavy steel scrap, Phila.	19.00	20.00	21.00	19.00
Heavy steel scrap, Ch'go	19.50	20.50	19.25	18.50
No. 1 cast, Pittsburgh	19.50	19.50	19.50	21.00
No. 1 cast, Philadelphia	20.00	20.50	20.00	21.00
No. 1 cast, Ch'go (net ton)	19.50	20.50	19.50	20.50
No. 1 RR. wrot., Phila.	21.00	21.00	21.00	22.00
No. 1 RR. wrot. Ch'go (net)	17.50	18.00	17.00	15.50
Coke, Connellsville,				
Per Net Ton at Oven:				
Furnace coke, prompt	$3.85	$4.00	$3.75	$4.00
Foundry coke, prompt	4.75	5.00	4.50	4.75
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	15.12½	15.25	14.87½	13.00
Electrolytic copper, refinery	14.75	14.87½	14.50	12.37½
Zinc, St. Louis	7.80	7.87½	7.57½	6.50
Zinc, New York	8.15	8.22½	7.92½	6.85
Lead, St. Louis	10.35	10.35	9.62½	8.10
Lead, New York	10.60	10.60	10.00	8.37½
Tin (Straits), New York	57.00	58.80	57.25	50.00
Antimony (Asiatic), N. Y.	17.37½	17.50	14.00	10.50

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market report on other pages.

THE IRON AGE Composite Prices

Jan. 20, 1925, Finished Steel, 2.560c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 88 per cent of the United States output of finished steel.

Jan. 13, 1925,	2.560c.
Dec. 22, 1924,	2.546c.
Jan. 22, 1924,	2.789c.
10-year pre-war average,	1.689c.

Jan. 20, 1925, Pig Iron, $22.50 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham.

Jan. 13, 1925,	$22.50
Dec. 22, 1924,	22.09
Jan. 22, 1924,	22.18
10-year pre-war average,	15.72

1924 High	1924 Low		1923 High	1923 Low
2.789c., Jan. 15	2.460c., Oct. 14	Finished Steel	2.824c., April 24	2.446c., Jan. 2
$22.88, Feb. 26	$19.21, Nov. 3	Pig Iron	$30.86, March 20	$20.77, Nov. 20

Independent steel companies in this and nearby districts which for several weeks have been running at close to physical capacity, still are maintaining this rate of production and lately the Carnegie Steel Co., under the impetus of orders very much in excess of shipments, has been putting on much idle capacity. That company now has 48 of its 58 blast furnaces in production and as soon as arrangements can be made for supplies of coke it will put on two more stacks, probably of its Duquesne, Pa., group. The company last week produced ingots at the rate of about 93 per cent of capacity and it is expected that rate will be surpassed during the present week.

The Republic Iron & Steel Co. has put off a furnace at Youngstown and the Top Mill furnace of the Wheeling Steel Corporation recently was blown out for repairs. The current rate of ingot production of Pittsburgh and adjacent districts now is above 85 per cent of capacity. The Jones & Laughlin Steel Corporation has one idle blast furnace, but is actually producing more iron and steel than it did before when all 12 of its blast furnaces were in production. This company made several production records in December and indications are that it will make several more this month. The interesting phase of the current high rate of production is that comparatively little steel is being stocked by manufacturers, and that acceptances by consumers and distributors are so free at a time when consumption usually is light.

The week has brought no change in steel prices, al-

though there continues to be the suggestion that plates, shapes and bars, even at today's quotations, are not profitable and the report persists that another advance in wire products is not far off. The great bulk of the 60-day contracts for wire products expired in the past week, but specifications probably will enable consumers and jobbers to get along without much additional buying for the next 30 days. The situation in semi-finished steel still is one of great firmness, although due more to the absence of offerings than because of large demand.

Pig iron prices are holding reasonably well in view of the fact that buying still is on a restricted scale and the development of pronounced weakness in the coke market appears to have intensified that tendency since it removes at least temporarily an argument in favor of higher pig iron prices. It now develops that a number of the smaller Connellsville district operators did not go along with the wage revision made by the larger producers in that district during the past month and the former consequently are able to produce and sell at relatively low prices. The weakness thus created has been heightened by the fact that a good deal of capacity was started by producers without definite sources of outlet and there has been too much spot coke for the demand. The scrap market also has shown a softer tendency in the past week. In both coke and scrap the belief has been common among consumers that prices advanced altogether too far.

Pig Iron.—This market appears to be getting fairly established at $23 Valley furnace for second quarter tonnages of foundry iron. A middle interest reports sales aggregating 1700 tons for that delivery at $23 for No. 2 with the usual differential of 50c. a ton for No. 2X iron. The sale also is reported of 1500 tons of No. 3 foundry iron to a Pittsburgh district melter at $22.50, Valley furnace, which, allowing for the usual silicon differential, would be equal to $23 for the base grade. The foundry iron market still is quotable at $22.50 to $23, Valley furnace for No. 2 grade, because iron for shipment over the remainder of this quarter still can be had at the lower figure. Likewise there is no reason to change prices on other grades. A steel foundry interest which recently inquired for 3000 to 5000 tons of basic iron for delivery to Alliance, Ohio, in February, March and April, evidently was able to get this tonnage at $22 because quotations above that figure failed to bring the order or any part of it. There was one sale of 500 tons of Bessemer iron for early delivery to Pittsburgh at $23, Valley Furnace, and the Wheeling Steel Corporation is in the market for 5000 tons of this grade due to the fact that it had recently put down one of its blast furnaces for repairs.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.76 per gross ton:

Basic	$22.00 to $22.50
Bessemer	23.00 to 23.50
Gray forge	22.00 to 22.50
No. 2 foundry	22.50 to 23.00
No. 3 foundry	22.00 to 22.50
Malleable	22.50 to 23.00
Low phosphorus, copper free	29.00

Ferroalloys.—In the advance of a week ago in ferromanganese makers do not seem to have followed the usual procedure of allowing the old price to stand for a day or so and with the appearance of $115, the old price of $110 disappeared as a quotation. There was little or no business pending at the time and on such business as has since been done the price has been $115, Atlantic seaboard. Only small lots are selling, however, as most consumers still have considerable tonnage due them on old contracts placed well below today's price. There is some tendency among the steel companies to complain that British ferromanganese prices, and for that matter other products where the British have control of prices, have advanced too much and too rapidly, based on conditions abroad and that war debt payments are a factor, is a charge heard in some quarters. Sales of 50 per cent ferrosilicon within the week at $82.50, as against the recent advance to $85, come at a time when suggestions were beginning to be heard of a further advance, this time to $90. Spiegeleisen is no more than steady as to prices; lots as small as a carload are bringing out quotations of $33, furnace, for 20 per cent material. In general, there is not much new business, but specifications against contracts are fairly good. Prices are given on page 309.

Semi-Finished Steel.—The situation remains very firm, but this condition appears to be due more to a dearth of offerings than because of a large or urgent demand. Actually, there are few nonintegrated manufacturers who underestimated their requirements and must have additional tonnages, while there is no complaint on the score of shipments on contracts. The test of demand is largely absent, but, on the other hand, the producers claim to have no open hearth steel for sale for shipment over the remainder of this quarter. Quotations, so far as open hearth steel is concerned, therefore, are only an appraisal. There seems to be a supply of Bessemer steel, but not much demand for it. Real activity is lacking in wire rods. Higher asking prices for skelp are not the result of a good demand, but rather are due to the fact that producers believe they should get more money. Prices are given on page 309.

Iron and Steel Bars.—Much talk is heard of an advance to 2.20c., base, Pittsburgh district mills, for steel bars, but there has been no definite action in that direction as yet. The market, however, is very firm at 2.10c. and that price is finding basis in fairly numerous, though individually small, sales. January specifications on business placed in November and December have been heavy and specifications for next month are good, indicating a continued good operation of bar mills. Iron bar prices are up $2 a ton, with refined iron bars now held at 3c., base, for large lots. Prices are given on page 308.

Structural Material.—Steel fabricating shops in this district have fairly heavy order books, yet are able to take on more business, particularly for early delivery, since shipping instructions are slow on such a considerable part of the business that has been booked. Structural mills, however, are well engaged in rolling the steel that will be required in the filling of the fabricated orders. There is much firmness in the plain material, with some talk of a further advance, but competition for orders that will engage shop capacity during the winter months is keeping the fabricated steel market in buyers' favor. Plain material prices are given on page 308.

Plates.—The market here still is quotable at recent prices and is firm. That condition is not attributable to a large demand, but rather to the fact that prices are regarded as too low by a number of makers and being well supplied with orders in other products they are not exerting much energy to get plate business at today's quotations. Specifications are coming in steadily against railroad car orders, but tank makers have little business and their requirements are in keeping. Prices are given on page 308.

Wire Products.—A good many 60-day contracts expired on Jan. 15, and to save the advantage of $2 a ton, the difference between present prices and those at which the contracts were entered, jobbers have been specifying with much freedom in the past week. One maker here reports specifications to be equal to mill capacity over the next 30 days. The common expectation is of a big spring business in fence and fence wire, not only because of the betterment in farm products prices, but because there was so little activity last year in those lines. Mill prices still are firm, despite continued weakness in the secondary markets, especially on nails. Prices are given on page 308.

Rails and Track Supplies.—Railroads are specifying fairly freely on spikes and other track supplies contracted for at below today's levels, but there is only a fair business at present prices. The desire of makers of light rails still is to obtain more money, but the demand is not sufficient to enable them to do so. Prices are given on page 308.

Cold-Finished Steel Bars and Shafting.—The market is not really active, but it is the experience of all makers here that specifications on contracts have shown a material gain in the past week over those of the first two weeks in the year. With the automotive industry scheduling a higher rate of production for February, the expectation is for further increase in shipping instructions. Capacity is now so large in cold-finished steel bars that taken in conjunction with the excellent transportation conditions now existing, there is no longer the tendency there was a few years ago for buyers to order very far ahead of their real requirements. The price situation is unchanged. Prices are given on page 308.

Hot-Rolled Flats.—A really good demand exists for the narrow sizes and some makers are so well supplied with business that they are quoting well above the regular market quotations because they do not want additional tonnage. In the wider material, especially in that wider than 10 in., there is still considerable open capacity and much competition for business. Prices are given on page 308.

Cold-Rolled Strips.—January usually is a quiet month in this product and this year is no exception to the rule. Buyers took out a good deal more tonnage in December than usual and naturally their requirements this month are rather light. The market still is quotable from 4c. to 4.15c., base Pittsburgh, but it takes an unusually attractive order to bring out the lower quotation. On smaller tonnages mills in this district are firm at 4.15c.

Bolts, Nuts and Rivets.—Makers of bolts and nuts in this district are fairly busy, but engagement of capacity is largely on specifications on fourth quarter contracts, not much specifying against first quarter contracts having been done. Freight allowance on bolts and nuts was originally supposed to apply only on shipments into jobbers' stocks, but no way has been found to get around shipments direct to consumers and the freight within the zone limits is also being absorbed on business of that sort. Prices are holding well on bolts and nuts and also on rivets, in which there is a very fair movement. Prices and discounts are given on page 309.

Tubular Goods.—The story about pipe is a repetition of that of the past few weeks. Jobbers are preparing for a good spring business in pipe for building purposes and specifications for the buttweld sizes are good. The demand for lapwelded pipe leaves something to be desired, although there has been some improvement in that direction as a result of purchases for stock by oil country distributors. The oil situation is not improving much or rapidly and the generally accepted belief that prices of pipe will not be higher in the near future also explains the lack of really active buying. Outside of the recent revision in list prices of seamless steel tubes, which all makers have adopted, the price situation in boiler tubes still is irregular and easy. There is not yet enough business to give all makers a share. Discounts are given on page 308.

Sheets.—Specifications against contracts have been somewhat heavier in the week under review than in the preceding two weeks, but fresh irregularity in black sheet prices indicates that some mills still are having trouble in getting early shipment instructions. Four or five mills, lacking sufficient early delivery business in that finish, are quoting 3.50c. to get orders to round out schedules and on particularly attractive orders even that price has not been the minimum. Heavier production schedules for the automobile builders for February encourage expectations of heavier automobile body sheet specifications, which have been light with nearby mills lately. Sheet mills are producing at the rate of about 85 per cent, as compared with 82 per cent in December. Prices are given on page 308.

Tin Plate.—Specifications are heavier than they have been and mill operations are rising. March shipments have to be specified by Jan. 15 and there is more consumption of tin plate in that month than in January or February. There is at least an 85 per cent operation of capacity in this and nearby districts. Mills are well committed against production over the first half of this year and, expecting full specifications, they are not "hungry" for additional business. There are some cases where makers have refused to quote against export inquiries and second quarter domestic business. Formal announcement of a second quarter price is hardly likely since so many makers sold themselves up for six months.

Coke and Coal.—Spot coke prices have given way rather sharply in the past week. On furnace grade sales have been made as low as $3.85 and $4 per net ton at ovens has become the maximum price. Although some producers still are asking $5.50 and even more for spot foundry coke, $5.25 appears to be as high as any recent sales have been made, and sales of standard 72-hr. fuel have been made as low as $4.75. Meanwhile, any negotiations which have been started for second quarter furnace coke requirements have been halted by the week's developments. It now develops that a number of the smaller producers did not advance wages as did the larger producers last month, and paying a lower wage scale, they can sell profitably at lower prices than those asked by the larger operators. Much of the production of the smaller operators is coming on the market because it had not been contracted for, and with all blast furnaces now in operation which run on Connellsville coke covered by contract, there has been only a limited market for spot offerings. The latter have accumulated heavily and in the effort to move them prices have had to be made attractive. This has some effect upon contracts, since spot supplies will be taken by furnace operators and the minimum tonnage on contracts specified. A price as high as $5.50 still is heard on second quarter contracts, but it is merely a quotation and likely to be shaded materially on the first real test in the shape of a bona fide inquiry. Production of coal still is too heavy to allow the market to strengthen. Prices are given on page 309.

Old Material.—The market is slightly weaker on heavy melting steel, offerings of which have increased in the past week, but so far that weakness has not extended to the other open-hearth grades, the market being actually higher on compressed and bundled sheets, supplies of which still are scant. A weaker market in the East on heavy steel scrap has brought many offerings from that direction and provided some competition for local yard stocks. Youngstown dealers have been offering $22 for heavy steel scrap for delivery at Youngstown or Warren, Ohio, presumably against a sale at $22.50 at the latter point, but locally, $22 seems to be all that can be obtained from consumers and there have been sales at $21.50. The steel foundry grades still are holding and light supplies sustain prices of turnings and other light material. As much as $17.50 was obtained for about 2500 tons of mixed borings and turnings for delivery at a point just outside the Pittsburgh district to the east, but for nearby delivery that price is about $1.50 a ton too high.

We quote for delivery to consumer's mill in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

	Per Gross Ton
Heavy melting steel	$21.50 to $22.00
No. 1 cast, cupola size	19.50 to 20.00
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.	22.50 to 23.50
Compressed sheet steel	20.50 to 21.00
Bundled sheets, sides and ends	19.50 to 20.00
Railroad knuckles and couplers	23.50 to 24.00
Railroad coil and leaf springs	23.50 to 24.00
Low phosphorus blooms and billet ends	26.50 to 27.00
Low phosphorus plate and other material	25.00 to 26.00
Railroad malleable	21.00 to 21.50
Steel car axles	23.50 to 24.00
Cast iron wheels	21.00 to 21.50
Rolled steel wheels	23.50 to 24.00
Machine shop turnings	17.50 to 18.00
Short shoveling turnings	17.50 to 18.00
Sheet bar crops	23.50 to 24.00
Heavy steel axle turnings	19.00 to 19.50
Short mixed borings and turnings	15.50 to 16.00
Heavy breakable cast	19.00 to 19.50
Stove plate	17.00 to 17.50
Cast iron borings	17.50 to 18.00
No. 1 railroad wrought	18.00 to 18.50
No. 2 railroad wrought	22.00

Chicago

Leading Independent Advances Prices of Plates, Shapes and Bars

CHICAGO, Jan. 20.—The leading independent late today advanced its prices on plates, shapes and soft steel bars $2 a ton, making shapes and plates 2.30c, Chicago, and bars 2.20c. This move accompanies the opening of books for second quarter, following the accumulation of business which will engage the company's capacity through the remainder of the current quarter. Similar advances are expected on sheets and rail steel bars.

This development will, it is expected, stimulate second quarter sales as well as specifications against first quarter commitments. It comes at a time when buyers were commencing to show a propensity to rest on their oars after three months of activity. In fact, a reaction in the primary materials had encouraged the view that there was no longer such urgent need of haste in covering future requirements. Scrap prices, for example, have undergone a general decline for the first time since the continuous advance in old materials commenced last June. This is believed, however, to be merely a temporary reaction following an advance which was more rapid than general market conditions warranted.

The pig iron market is unusually quiet, but this, too, finds a logical explanation in the heavy purchases during the past three months which covered the needs of melters through this quarter and into next. The view is still held in some quarters that the buying movement which was released at the time of the Presidential election went ahead faster than actual business conditions warranted; in a word, that purchasing agents bought beyond their actual known requirements to protect themselves against advances. It is too early to ascertain to what extent, if any, speculative buying was a factor.

It is clear that consumption is heavier than during the pre-election months, but whether it measures up to the present high rate of production is still problematical. Reports regarding specifications are not uniform; in the case of some producers, particularly those making the heavier finished products, pressure for deliveries is still strong; specifications for some of the other commodities show a tendency to lag.

Continued activity in building is indicated by fresh awards of large tonnages. For an addition to the American Furniture Mart, Chicago, 3000 tons will be fabricated by the Duffin Iron Works. The structural steel, amounting to 500 tons, has not been placed. Railroad buying remains an important factor. The New York Central has placed 1000 gondola cars and the Rock Island has entered the market for 1600 freight cars and 10 locomotives. The Chicago & Alton has ordered 1300 tons of rails from the Inland Steel Co., this being in addition to the 8000 tons placed with the Gary mill.

Among the commodities which are not yet free from price irregularities are cold-strip steel, on which 4c., Cleveland, has been done as compared with the regular quotation of 4.15c., and wire products, which have been shaded $1.

Local steel works output remains at slightly better than 95 per cent of capacity, and there have been no further additions to the active blast furnace capacity serving the mills, although a twelfth Gary stack may go in this week. At Duluth, however, one of the stacks of the Minnesota Steel Co. has gone in.

Pig Iron.—The market is quiet, with local iron unchanged at $24, base furnace. The pause in activity is not altogether surprising in view of the heavy buying of the past three months, which largely covered the requirements of melters through this quarter and into next. At the moment melters are directing their attention to deliveries and in some instances cannot get shipments fast enough. It cannot be said, however, that pressure for deliveries is uniformly insistent, but it is of sufficient volume to force producers to extend themselves to fill specifications. Nevertheless, there does not appear to be any immediate prospect of further additions to active merchant blast furnace capacity. Among the few current inquiries may be mentioned 1000 tons of foundry for a local plant and 800 tons for a Michigan plant wanted for second quarter delivery and 1000 tons of foundry for another Chicago plant on which early shipment is asked. A Wisconsin user is inquiring for 500 tons of low phosphorus and a local buyer is inquiring for an equal tonnage of the same material for delivery to a plant on the Eastern seaboard. Foreign low phosphorus has been offered at $26, Eastern seaboard, but that figure is not low enough to bring the material into this market. Occasional concessions of 50c. to $1 a ton are still reported on silvery. Charcoal is strong and the report persists that it will soon advance. Southern foundry remains unchanged at $20 to $21, base Birmingham, with sales inconsequential in this territory. We note a sale of 400 tons of 6 per cent silvery for first half delivery to a Michigan melter. Among melters whose operations are still lagging may be mentioned jobbing foundries and plants serving the automobile industry.

Quotations on Northern foundry, high phosphorus, malleable and basic iron are f.o.b. local furnaces and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards.

Northern No. 2 foundry, sil. 1.75 to 2.25	$24.00
Northern No. 1 foundry, sil. 2.25 to 2.75	25.00
Malleable, not over 2.25 sil.	24.00
Basic	24.00
High phosphorus	24.00
Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	29.04
Southern No. 2 (barge and rail)	25.18
Southern No. 2 sil. 1.75 to 2.25	$26.01 to 27.01
Low phos., sil. 1 to 2 per cent, copper free	34.29
Silvery, sil. 8 per cent	35.29
Electric ferrosilicon, 14 to 16 per cent	45.75

Ferroalloys.—The advance to $115, seaboard, on ferromanganese has become general. All of the ferroalloys are quiet.

We quote 80 per cent ferromanganese, $122.56, delivered; 50 per cent ferrosilicon for 1925 delivery, $85.00, delivered; spiegeleisen, 18 to 22 per cent, $41.58, delivered.

Wire Products.—In general it would appear that specifications are improving, but the experience of all mills is not uniform in this respect. The price situation is not yet free from irregularities and concessions of $1 a ton are occasionally reported. Mill operations average 80 per cent or better. For mill prices see page 308.

Plates.—A local mill has booked 16,000 tons of plates, shapes and bars during the week for railroad car construction and in view of fresh orders for cars, additional tonnage is in prospect. A Lake boat to be built by the Manitowoc Shipbuilding Co. requires 3000 tons, which will also be rolled here. While orders for oil storage tanks are few, tank builders have placed 1500 tons of plates in the Chicago market. Prices are firm and an early advance is a possibility.

The mill quotation is 2.20c., Chicago. Jobbers quote 3.10c. for plates out of stock.

Sheets.—Local mills are heavily sold for first quarter and are taking new business sparingly pending the announcement of second quarter quotations, which are expected to be $2 to $4 above present prices. New buying is less active, but this is not surprising in view of the heavy orders placed in December and November. The recent lagging tendency of specifications may be accounted for by the inventory taking period, which is particularly important in its effect on the attitude of jobbers. Mills in this district are running full.

Chicago delivered prices from mill are 3.75c. for No. 28 black, 2.85c. for No. 10 blue annealed, 4.90c. for No. 28 galvanized. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Jobbers quote f.o.b. Chicago: 3.80c. base for blue annealed, 4.50c. base for black, and 5.50c. base for galvanized.

Rails and Track Supplies.—Miscellaneous orders for rails, largely from frog and switch makers, added 12,000 tons to the books of a local mill. Buying of track fastenings has been confined to small lots. Rail specifications are lagging, but railroads are in no great hurry to obtain deliveries in view of the cold weather. Altogether local rail mill capacity is probably less than 50 per cent engaged.

Standard Bessemer and open-hearth rails, $43; light rails, rolled from billets, 1.90c. to 2c., f.o.b. makers' mill.

Standard railroad spikes, 2.90c. mill; track bolts with square nuts, 3.90c. mill; steel tie plates, 2.35c., f.o.b. mill; angle bars, 2.75c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.45c. base, and track bolts, 4.45c. base.

Bars.—Notwithstanding the heavy operations of local mills rolling soft steel bars, shipments still fall short of new commitments. In fact, the rolling of much of the tonnage now being bought will overlap into second quarter and it is not surprising, therefore, that producers are giving thought to the establishment of prices for that period. A leading independent is momentarily expected to announce an advance of at least $2 a ton and possibly $4, which, if plates and shapes are raised $2, would put the prices of all three commodities on a parity. Bar iron is also stronger following the accumulation of substantial back logs, which, in the case of one mill, insures six to eight weeks' operation. Most producers are holding to a minimum of 2.10c., but the quotation of 2c., Chicago, has not entirely disappeared. Rail steel bars are also firmer and an early advance is talked of, notwithstanding recent irregularities, particularly locally, where occasional concessions to as low as 1.90c., mill, have been reported. An advance in rail steel, of course, is largely dependent on what happens to billet steel, rail steel bars generally being $2 to $3 a ton below mild steel bars.

Mill prices are: Mild steel bars, 2.10c.; common bar iron, 2c. to 2.10c., Chicago; rail steel, 2c. to 2.10c., Chicago mill.

Jobbers quote 3c. for steel bars out of warehouse. The warehouse quotations on cold-rolled steel bars and shafting are 3.80c. for rounds and 4.30c. for flats, squares and hexagons; 4.15c. for hoops and 3.65c. for bands.

Jobbers quote hard and medium deformed steel bars at 2.60c.

Structural Material.—Lettings for the week include a number of sizable jobs, notably the Jackson Shore Apartment Building, Chicago, 2500 tons, which was awarded to the American Bridge Co., and a sugar plant, Sidney, Mont., 1000 tons, which went to the Minneopolis Steel & Machinery Co. Mills are well booked with plain material required for the heavy lettings of the past three months. The market is firm and unchanged at 2.20c., Chicago, but an independent contemplates an advance of at least $2 a ton to cover second quarter deliveries.

The mill quotation on plain material is 2.20c., Chicago. Jobbers quote 3.10c. for plain material out of warehouse.

Bolts, Nuts and Rivets.—First quarter specifications in bolts and nuts are only fair, although improving. Bolt and nut makers, however, are very busy filling the heavy specifications which were released before the close of the last quarter. Small rivets are still irregular, ranging from 70 and 10 off to 70 off, delivered within zone limits.

Jobbers quote structural rivets, 3.50c.; boiler rivets, 3.70c.; machine bolts up to ⅝ x 4 in., 55 per cent off; larger sizes, 55 off; carriage bolts up to ⅝ x 4 in., 50 off; larger sizes, 50 off; hot pressed nuts, squared, tapped or blank, $3.50 off; hot pressed nuts, hexagon, tapped or blank, $4 off; coach or lag screws, 60 per cent off.

Cast-Iron Pipe.—Detroit has awarded 2600 tons of 6-, 8- and 12-in. to James B. Clow & Sons and 2000 tons of 6- and 8-in. to the United States Cast Iron Pipe & Foundry Co. The latter company has also booked 320 tons of 4- to 12-in. for Janesville, Wis., and is low bidder on 430 tons for Akron, Ohio. St. Paul has tentatively awarded 2600 tons of 4- to 16-in. to the National Cast Iron Pipe Co. James B. Clow & Sons are low bidders on 1500 tons for Saginaw, Mich., considering the tonnage as a whole, while the Glamorgan Pipe & Foundry Co. and the National company filed low tenders on parts of the tonnage. Detroit will receive figures on 1500 tons of 6-in., and 1500 tons of 8-in. class B, and 1000 tons of 12-in. class C, Jan. 28. Buffalo will take bids Feb. 5 on 1600 tons of 4- to 16-in. Prices are stronger and now range from $41 to $42, base Birmingham, for 6-in. and larger.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., $53.20 to $54.20; 6-in. and over, $49.20 to $50.20; Class A and gas pipe, $4 extra.

Reinforcing Bars.—The heavily sold up condition of the mills has been reflected in a firmer attitude on the part of reinforcing bar dealers. Except for small lots, which can be sandwiched into present rolling schedules, April deliveries are the best to be obtained from local mills. With price advances in prospect, the placing of pending reinforcing work is being hastened. The financing for the South Water Street Removal Co. market center, Chicago, has been completed, and the general contracts for the stores have been placed. The stores will be reinforced concrete design and will take approximately 4000 tons.

Lettings include:

Section A, municipal sewer, St. Paul, Minn., 1200 tons to Kalman Steel Co.

Filtration and water softening plant, Springfield, Ill., 600 tons of rail steel to Laclede Steel Co.

Edward Katzinger Co. warehouse, Chicago, 600 tons to Truscon Steel Co.

Rock Island Lines, 400 tons to Truscon Steel Co.

St. Luke's Hospital, Cedar Rapids, Iowa, 100 tons to Olney J. Dean & Co. instead of to another fabricator as reported last week.

Linwood Cement Co. plant, Linwood, Iowa, 400 tons to Concrete Steel Co.

Pending work includes:

South Water Street Removal Co., stores for new market center, Chicago, 4000 tons, general contract awarded to McLennan Construction Co.

Section B, municipal sewer, St. Paul, Minn., 500 tons.

Chicago Board of Education, elementary schools at Eighty-second and Bishop Streets, and Seventy-eighth Street and Prairie Avenue, 330 tons, general contract awarded to Lind Construction Co.

Chicago Board of Education, elementary schools at Sixtieth and Rockwell Streets, Seventieth and Merrill Streets, and Forty-eighth Street and Karlov Avenue, 100 to 125 tons each, bids asked.

Theater at Belmont and Lincoln Avenues, Chicago, 100 tons, general contract awarded to B. W. Construction Co.

Old Material.—The market is weak and prices of most grades have dropped 50c. to $1 a ton. This is the first decline in prices since, June, 1924, and for that reason is commanding wide attention. Although opinions are divided as to the causes for the reaction, most observers feel that the setback is only temporary and that a major downward movement is not to be looked for at this time. The quick change in sentiment is well illustrated by what happened in the case of heavy melting steel. Within the short period of one week this commodity has been bought by consumers at prices ranging from $21 to $20 delivered.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Iron rails	$21.00 to $21.50
Cast iron car wheels	21.00 to 21.50
Relaying rails, 56 and 60 lb.	26.00 to 27.00
Relaying rails, 65 lb. and heavier	27.00 to 32.00
Forged steel car wheels	23.50 to 24.00
Railroad tires, charging box size	24.00 to 24.50
Railroad leaf springs, cut apart	23.50 to 24.00
Rails for rolling	22.00 to 22.50
Steel rails, less than 3 ft.	22.00 to 22.50
Heavy melting steel	19.50 to 20.00
Frogs, switches and guards cut apart	20.25 to 20.75
Shoveling steel	19.25 to 19.75
Drop forge flashings	14.50 to 15.00
Hydraulic compressed sheets	16.50 to 17.00
Axle turnings	17.50 to 18.00
Steel angle bars	20.50 to 21.00
Steel knuckles and couplers	22.50 to 23.00
Coil springs	24.00 to 24.50
Low phos. punchings	21.00 to 21.50
Machine shop turnings	13.00 to 13.50
Cast borings	15.75 to 16.25
Short shoveling turnings	15.75 to 16.25
Railroad malleable	21.00 to 21.50
Agricultural malleable	20.00 to 20.50

Per Net Ton

Iron angle and splice bars	21.50 to 22.00
Iron arch bars and transoms	22.50 to 23.00
Iron car axles	27.50 to 28.00
Steel car axles	21.50 to 22.00
No. 1 busheling	15.75 to 16.25
No. 2 busheling	13.00 to 12.50
Pipes and flues	14.00 to 14.50
No. 1 railroad wrought	17.50 to 18.00
No. 2 railroad wrought	17.50 to 18.00
No. 1 machinery cast	19.50 to 20.00
No. 1 railroad cast	18.00 to 18.50
No. 1 agricultural cast	18.00 to 18.50
Locomotive tires, smooth	19.50 to 20.25
Stove plate	16.00 to 16.50
Grate bars	16.00 to 16.50
Brake shoes	16.00 to 16.50

New York

Renewed Flow of Contract Specifications for Steel—Pig Iron Market Quiet

NEW YORK, Jan. 20.—The inquiry of the Worthington Pump & Machinery Corporation for from 6000 to 8000 tons of pig iron for delivery to various plants in the second quarter is still pending, and the Burnham Boiler Co. has come into the market for from 2500 to 3500 tons of various grades for delivery in part in the second quarter and in part in the first quarter. These are the only inquiries for large tonnages pending, and the market is very quiet. The sale of a round tonnage of charcoal iron was probably the leading transaction of the week. No details in regard to it were announced. The report that the $23 base price at Buffalo had been shaded 50c. is attributed by sellers to the reselling of a limited tonnage in that district. It is understood, however, that iron could be obtained outside the Buffalo district in northern New York at $23, furnace. This quotation furnishes strong competition in New England territory for Buffalo furnaces. In eastern Pennsylvania $24 is commonly asked, but $23.50 has not disappeared and the market is untested.

We quote delivered in the New York district as follows, having added to furnace price $2.52 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.44 from Virginia:

East. Pa. No. 2, sil. 1.75 to 2.25	$26.02
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	27.52
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	26.52
Buffalo, sil. 1.75 to 2.25	27.91
No. 2 Virginia, sil. 1.75 to 2.25	30.44

Ferroalloys.—Current demand for ferromanganese is light and confined to small and carload lots. These have appeared only in inquiries and no sales are reported at the new price of $115, seaboard basis. The spiegeleisen market is also quiet at unchanged prices. In both commodities consumers are evidently well covered for the first quarter.

Cast Iron Pipe.—Makers of water and gas pipe are fairly well booked for the rest of the first quarter. Specifications on the expected purchase of pipe by the city of New York are expected to appear within the next week to 10 days and the call for bids by the city of Philadelphia is looked for before long. Although current purchasing of soil pipe is light, jobbers who made contracts in the latter months of last year are reported pressing for early delivery, partly as a result of the open winter. Stocks on hand are not believed to be large and a renewal of buying is looked for early in the spring. Discounts continue unchanged. One Southern maker is understood to have decreased his count by 5 points.

We quote pressure pipe per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, $54.60 to $55.60; 4-in. and 5-in., $59.60 to $60.60; 3-in., $69.60 to $70.60, with $5 additional for Class A and gas pipe. Discounts on both Northern and Southern makers of soil pipe, f.o.b. New York, are as follows: 6-in., 40 to 41¼ per cent off list; heavy, 50 to 51¼ per cent off list.

Warehouse Business.—Inquiries came in more abundantly, but transactions are neither large nor numerous. Most of the inquiries name delivery in March or April. Strength in prices prevails. An increase in galvanized sheets still seems impending. With mills less ready to offer immediate delivery, it is reasonable to expect a gradual quickening of activity; already this is felt in structural steel and reinforcing bars. Activity in welded pipe continues fair and there is general conformity to the new schedule of discounts quoted for the first time in last week's issue; prices are firm at these levels. There was a decided improvement in spring steel; although orders were not large, the aggregate made a fair total. Prices are given on page 324.

Finished Iron and Steel.—An interesting development of the past week was that several mills, seeking additional specifications on contracts, found an immediate response and were able to continue scheduling the rolling capacity. Also several mills, to fill up March schedules, have begun approaching customers by indicating that prices, at least of the heavy tonnage products, will be advanced $2 per ton for the second quarter. The security which buyers feel they have in getting desired deliveries has not resulted as yet in any volume of forward buying. The signs are that this will not materialize before March and that contracts may be closed then at today's prices not merely for March, but for a part of the second quarter. Small lots, for example sheets, have been bought for deliveries extending into April at current quotations. Further effort appears to be in the making to mark up plates in the East. One mill is quoting on a basis of 2.25c., Pittsburgh, though a small lot was sold at 1.90c.; the plate market continues at a 2c. basis. Some large structural steel projects have kept up the volume of bookings of fabricated steel work and continued buying is looked for from the railroad equipment field. Reinforced concrete bar makers have large backlogs awaiting better weather, especially for road construction, and little or none of this is regarded as likely to be cancelled. The lighter sheets are none too firm and wire nails are seasonally dull. An Atlantic yard is sounding the market for 2000 tons of hull plates.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.44c.; plates, 2.34c. to 2.44c.; structural shapes, 2.34c. to 2.44c.

Old Material.—While there has been no distinct downward movement of prices, an undertone of weakness is reflected in practically all grades by lower buying prices of brokers and dealers. Borings and turnings are an exception to the lower offerings on most grades, as high as $14 per ton being paid for delivery to Bethlehem and $14.50 per ton, delivered Steelton. As this grade has consistently lagged behind the rest of the market for some time, the present offering prices actually bring it only into line with the general run of quotations. No. 1 heavy melting steel is being purchased by most brokers at $18.50 to $19.50 per ton, delivered eastern Pennsylvania, as high as $20 per ton, only prevailing occasionally. At least one of the mills for which the higher buying price was offered has temporarily curtailed shipments. A purchase in the past week of about 20,000 tons of heavy melting steel by a large eastern Pennsylvania consumer seems to have established the minimum price at $19 delivered, $18.50 per ton, the buying price of brokers. Stove plate delivered eastern Pennsylvania is among the grades showing a slight weakness, $16 per ton being the buying price today.

Buying prices per gross ton New York follow:

Heavy melting steel, yard	$14.00 to $14.50
Heavy melting steel, railroad or equivalent	15.50 to 16.00
Rails for rolling	16.00 to 16.50
Relaying rails, nominal	24.00 to 25.00
Steel car axles	21.50 to 22.50
Iron car axles	27.00 to 28.00
No. 1 railroad wrought	15.50 to 16.00
Forge fire	12.50 to 13.50
No. 1 yard wrought, long	15.00 to 16.00
Cast borings (steel mill)	11.50 to 12.00
Cast borings (chemical)	17.50 to 18.00
Machine shop turnings	12.50 to 13.00
Mixed borings and turnings	11.00 to 11.50
Iron and steel pipe (1 in. diam., not under 2 ft. long)	13.75 to 14.25
Stove plate	12.25 to 12.75
Locomotive grate bars	14.00 to 14.50
Malleable cast (railroad)	16.00 to 16.50
Cast iron car wheels	16.00 to 17.00
No. 1 heavy breakable cast	14.25 to 14.75

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast	$18.50 to $19.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	16.50 to 17.00
No. 2 cast (radiators, cast boilers, etc.)	15.50 to 16.00

Decision for McClintic-Marshall Company

WASHINGTON, Jan. 20.—In a decision announced today, the Interstate Commerce Commission held that the McClintic-Marshall Steel Supply Co. was entitled to an award of reparation on shipments of structural steel Va., based on the difference between the fifth class rate of 40.5c. per 100 lb. charged and the commodity rate of 38c., which applies from the Pittsburgh district, Richmond and group points.

Cincinnati

Pig Iron Dull—Southern Price for Second Quarter $1 Above First Quarter

CINCINNATI, Jan. 20.—The market continues dull. The largest sale of the week was of 1000 tons of iron for second quarter shipment on the basis of $23, Ironton. Another sale of 400 tons of malleable at $22.50, Columbus, was reported, and several lots went on the basis of $22, Ironton. It is reported that a quotation of $21.75 has been made on an inquiry for 1000 tons by an Ironton district stack, but generally the market range is $22 to $23 for first half. In the South, the range is from $20, Birmingham, for first quarter to $21 for second quarter. We note a sale of 800 tons for second quarter at $21. We also note a sale of 100 tons of silvery iron, 8 per cent, at the full schedule. It is possible to secure concessions on the higher silveries, but the schedule is being maintained below 9 to 10 per cent. The largest inquiry is for 1500 tons for the Worthington Pump & Machinery Corporation's Cincinnati plant, including foundry and Bessemer grades.

Based on freight rates of $4.05 from Birmingham and $2.27 from Ironton we quote f.o.b. Cincinnati:

Southern fdy., sil. 1.75 to 2.25 (base)	$24.05 to	$25.05
Southern fdy., sil. 2.25 to 2.75	24.55 to	25.55
Southern Ohio silvery, 8 per cent		32.77
Southern Ohio fdy., sil. 1.75 to 2.25	24.27 to	25.27
Southern Ohio, basic (nominal)		24.27
Southern Ohio, malleable	24.27 to	25.27

Sheets.—A change in the situation occurred during the past few days. Whereas last week some consumers were holding up January quotas, this week requests for early shipment are numerous, and some buyers who had underestimated their requirements have placed additional orders. Reports are current of price shading in blue annealed and black sheets of $2 per ton, but it now appears that these prices are being made on additions to contracts, and that new business is not being booked at these figures. Tin plate is firm at $5.50 per base box. Sheet prices generally quoted are 2.70c. for blue annealed, 3.60c. for black and 4.75c. for galvanized, f.o.b. Pittsburgh.

Structural Activity.—No new inquiries have appeared and awards were confined to gas holder work. Two projects requiring 1200 tons will be awarded Jan. 20.

Reinforcing Bars.—It is expected that an award of 600 tons for an addition to the Lilly Hardware & Paint Co.'s warehouse at Indianapolis will be made this week. This is the only project up for bids. Two large projects in Cincinnati, for which bids have been opened, will be awarded this week. Reinforcing bar prices range from 2c. for hard steel to 2.10c. for new billet stock.

Warehouse Business.—Jobbers report an improvement last week over the previous week, and are expecting further increase in business. Prices are very firm, but unchanged.

Cincinnati jobbers quote: Iron and steel bars, 3.30c.; reinforcing bars, 3.30c.; hoops, 4.35c.; bands, 3.95c.; shapes, 3.40c.; plates, 3.40c.; cold-rolled rounds, 4.05c.; cold-rolled flats, squares and hexagons, 4.55c.; open-hearth spring steel, 4.75c. to 5.75c.; No. 10 blue annealed sheets, 3.90c.; No. 28 black sheets, 4.60c.; No. 28 galvanized sheets, 5.75c.; No. 9 annealed wire, $3.15 per 100 lb.; common wire nails, $3.15 per keg base; cement coated nails, $2.85 per keg.

Finished Materials.—The demand for finished materials showed improvement during the past week, and indications point to a continuance of the demand. While it is true that tonnages were in most cases light, they were heavier than the week previous, and the inquiries now being figured on are promising. Bars, shapes and plates are being taken in lots up to 100 tons at prices of 2.10c., Pittsburgh, for bars and shapes, and 2c., Pittsburgh, for plates. In the case of plates some of the large producers are now asking 2.10c. Wire products are in better demand for future shipment, and prices equivalent to $2.60, Ironton, for plain wire and $2.85, Ironton, for wire nails, are being steadily maintained. The demand for track accessories is showing some activity, but orders generally run to carload lots. Prices are firm.

Coke.—Connellsville furnace coke prices are off 25c. per ton in this market, now being available at $3.75. Prices in other districts are fairly steady. The demand for foundry grades is fair, but furnace coke is inactive.

Fluorspar.—A sale of 300 tons of 80 and 5 per cent material is reported to have been made at $19, f.o.b. mines. Prices range from $18 to $19 for 80 and 5 per cent and $19 to $20 for 85 and 5 per cent material.

Old Material.—Dealers report a willingness to buy on the part of consumers, and some grades were fairly active last week, including axles and railroad wrought. Prices generally are steadily held, athough there are rumors of offerings at lower prices, which, however, cannot be substantiated.

We quote dealers' buying prices, f.o.b. cars, Cincinnati:

	Per Gross Ton	
Heavy melting steel	$17.00 to	$17.50
Scrap rails for melting	16.50 to	17.00
Short rails	20.00 to	20.50
Relaying rails	31.00 to	31.50
Rails for rolling	18.50 to	19.00
Old car wheels	16.00 to	16.50
No. 1 locomotive tires	19.00 to	19.50
Railroad malleable	19.00 to	19.50
Agricultural malleable	18.00 to	18.50
Loose sheet clippings	13.50 to	14.00
Champion bundled sheets	14.50 to	15.00
	Per Net Ton	
Cast iron borings	13.00 to	13.50
Machine shop turnings	12.00 to	12.50
No. 1 machinery cast	20.00 to	20.50
No. 1 railroad cast	17.50 to	18.00
Iron axles	23.50 to	24.00
No. 1 railroad wrought	14.00 to	14.50
Pipes and flues	10.50 to	11.00
No. 1 busheling	12.50 to	13.00
Mixed busheling	10.00 to	10.50
Burnt cast	12.50 to	13.00
Stove plate	12.50 to	13.00
Brake shoes	14.00 to	14.50

Boston

Foreign and Charcoal Pig Iron Most Prominent in Buying

BOSTON, Jan. 20.—Foreign and domestic charcoal pig iron held the center of the stage the past week. Although comparatively little charcoal iron is consumed annually in this territory, the fact that approximately 20 per cent of the yearly amount consumed was purchased is noteworthy. Sales were on a basis of $26 furnace or $34.19 delivered. Dutch iron has sold and is offered at comparatively low prices. No. 1 iron sold at $25 a ton delivered in yard at Providence, R. I. Silicon 2.50 to 3 per cent is offered on about the same basis. India silicon 2.50 to 3 per cent sold at $24.50 to $25.50, duty paid on dock Boston, some of it to Providence interests at a delivered cost approximately $2 over the Dutch. Continental iron, some of it presumably German, is offered at prices a little under the India on dock Boston basis. Buffalo iron at $23 furnace base, second quarter delivery, is in larger supply, two furnaces heretofore inactive in this territory now being in the market. Buyers claim that Buffalo $22.50 base can be done. Prices on eastern Pennsylvania iron take a wide range. The most commonly quoted price is $24 furnace base, but a small amount is offered at $23.50. Pig iron prices collectively do not appear as firm as a week ago.

We quote delivered prices on the basis of the latest reported sales as follows, having added $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.92 from Virginia and $9.60 from Alabama:

East. Penn., sil. 1.75 to 2.25	$27.15 to	$27.65
East. Penn., sil. 2.25 to 2.75	27.65 to	28.15
Buffalo, sil. 1.75 to 2.25	27.41 to	27.91
Buffalo, sil. 2.25 to 2.75	27.91 to	28.41
Virginia, sil. 1.75 to 2.25	29.92 to	30.92
Virginia, sil. 2.25 to 2.75	30.42 to	31.42
Alabama, sil. 1.75 to 2.25	29.60 to	30.10
Alabama, sil. 2.25 to 2.75	30.10 to	30.60

Coke.—New England producers of by-product foundry coke are falling behind on deliveries. Specifications against first half contracts, although increasing, are below normal for this time of the year. The coke makers, however, are fairly buried with crushed coke business, and it is because of this fact that foundry coke shipments are backward. Both the New England Coal & Coke Co. and the Providence Gas Co. quote by-

product foundry coke $11.50 a ton delivered in New England.

Old Material.—With Pittsburgh district and eastern Pennsylvania steel mills less inclined to buy, and with New England melters well supplied for immediate needs, the old material market is quieter than it has been in several weeks. Prices are lower as a result of business conditions. The best price offered for heavy melting steel today is $16 on cars shipping point, 50c. less than a week ago. Corresponding reductions are noted in top prices offered for scrap rails, machine shop turnings, chemical borings, shafting, street car axles, forged scrap and bundled skeleton. Stove plate prices, on the other hand, are a shade firmer due to the sold up condition of that material. New England foundries continue to buy machinery cast from local or nearby yards, very often having the privilege of selecting material. The Boston market for cast therefore is quiet and about 50c. a ton lower.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast	$19.50 to $20.00
No. 2 machinery cast	17.00 to 18.00
Stove plates	15.50 to 16.00
Railroad malleable	20.00 to 20.50

The following prices are offered per gross ton lots, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$15.50 to $16.00
No. 1 railroad wrought	16.50 to 17.00
No. 1 yard wrought	15.50 to 16.00
Wrought pipe (1-in. in diam., over 2 ft. long)	13.50 to 14.00
Machine shop turnings	11.50 to 12.00
Cast iron borings, chemical	16.00 to 16.50
Cast iron borings, rolling mill	11.50 to 12.00
Blast furnace borings and turnings	9.50 to 10.00
Forged scrap	12.00 to 12.50
Bundled skeleton	12.00 to 12.50
Bundled cotton ties	11.50 to 12.00
Forged flashings	12.00 to 12.50
Shafting	19.50 to 20.00
Street car axles	19.00 to 19.50
Rails for rerolling	16.50 to 17.00
Scrap rails	15.50 to 16.00

St. Louis

Large Order for Pipe Will Probably Go to a Detroit Company—Scrap Declines

ST. LOUIS, Jan. 20—Sales of pig iron in St. Louis during the last week amounted to about 4000 tons. Of this, 500 tons of basic and 300 tons of foundry went to a machinery manufacturer in the district. The remainder of the orders were in carload lots up to 100 tons. Small orders likely will continue to rule until the buying movement for second quarter requirements begins. It is expected that the small-order business will increase in volume, as melters are doing more work than they had expected when they placed their first quarter pig iron orders. The anticipation of shipments ahead of schedule is a strong feature of the situation. The market continues strong at unchanged prices.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices $2.16 freight from Chicago, $3.28 from Florence and Sheffield (rail and water), $5.17 from Birmingham, all rail, and 81c. average switching charge from Granite City:

Northern fdy., sil. 1.75 to 2.25	$26.66
Northern malleable, sil. 1.75 to 2.25	26.66
Basic	26.66
Southern fdy., sil. 1.75 to 2.25 (rail)	$26.17 to 27.17
Southern fdy., sil. 1.75 to 2.25 (rail and water)	24.28 to 25.28
Granite City iron, sil. 1.75 to 2.25	24.81 to 25.31

Coke.—A better demand for coke is reported. Both industrial and domestic grades have moved in larger quantities as a result of the colder weather. A water gas company closed a contract for 1000 tons of industrial coke.

Finished Iron and Steel.—The contract for laying the 16-mile pipe line for the St. Louis waterworks likely will go to the Hay's Co., Detroit, the low bidder. The job will require 15,000 tons of pipe. The Missouri Pacific Railway has asked for prices on the repair of 2500 box cars and 250 gondolas. Business in other lines is quiet. Manufacturers of steel products and warehouses apparently have enough material on hand or bought for the present and immediate future.

For stock out of warehouse we quote: Soft steel bars, 3.15c. per lb.; iron bars, 3.15c.; structural shapes, 3.25c.; tank plates, 3.45c.; No. 10 blue annealed sheets, 3.90c.; No. 28 black sheets, cold rolled, one pass, 4.65c.; cold rolled rounds, shafting and screw stock, 3.95c.; structural rivets, 3.65c.; boiler rivets, 3.85c.; tank rivets, ¾ in. diameter and smaller, 70 per cent off list; machine bolts, 55 per cent; carriage bolts, 50 per cent; lag screws, 60 per cent; hot pressed nuts, squares, $3.50; hexagons, blank or tapped, $4 off list.

Old Material.—The market for old material is off 50c. to $1 a ton in the first setback in several months. The higher prices that have been offered for material caused heavier shipments into this market than it could take care of. Consumers are holding off in their purchases, although they have good sized order files, and there is plenty of new business in sight. Pending railroad lists include: International & Great Northern, 4000 tons; Rock Island, 2000 tons, and Wabash, 5000 tons.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton	
Iron rails	$17.50 to $18.00
Rails for rolling	21.50 to 22.00
Steel rails less than 3 ft.	21.50 to 22.00
Relaying rails, 60 lb. and under	25.00 to 26.00
Relaying rails, 70 lb. and over	32.50 to 33.50
Cast iron car wheels	21.00 to 21.50
Heavy melting steel	17.50 to 18.00
Heavy shoveling steel	17.50 to 18.00
Frogs, switches and guards cut apart	19.75 to 20.00
Railroad springs	22.00 to 22.50
Heavy axles and tire turnings	14.00 to 14.50
No. 1 locomotive tires	20.00 to 20.50
Per Net Ton	
Steel angle bars	17.50 to 18.00
Steel car axles	21.00 to 21.50
Iron car axles	26.00 to 26.50
Wrought iron bars and transoms	21.00 to 21.50
No. 1 railroad wrought	16.00 to 16.25
No. 2 railroad wrought	16.00 to 16.50
Cast iron borings	12.50 to 13.00
No. 1 busheling	16.50 to 17.00
No. 1 railroad cast	18.25 to 18.75
No. 1 machinery cast	19.50 to 20.00
Railroad malleable	17.00 to 17.50
Machine shop turnings	9.50 to 10.00
Champion bundled sheets	10.00 to 10.50

Birmingham

Little Demand for Pig Iron, but Prices Are Firm and Prospects Favorable

BIRMINGHAM, ALA., Jan. 20.—The pig iron sales in the Birmingham district continue slow, but the market remains exceedingly strong, the sales of the past two months covering the probable make of the first three months well. Production is to be increased again this month. The Tennessee Coal, Iron & Railroad Co. expects to have the big No. 1 blast furnace at Ensley in commission this week or the first of next, and also the Oxmoor furnace, the latter one of the old stacks of the district. The Sloss-Sheffield Steel & Iron Co. will have its seventh blast furnace in operation by Feb. 1, the old Cole furnace at Sheffield. Inquiries are still being received which indicate that there will be need for a large quantity of iron and personal inquiries show that some of the larger melters are about to enter the market again. Quotations are stronger, $21 being sounded out on second quarter delivery, while $20 to $20.50 is being got on iron for the first three months' delivery.

We quote per gross ton, f.o.b. Birmingham district furnaces, as follows:

No. 2 foundry, 1.75 to 2.25 sil.	$20.00 to $21.00
No. 1 foundry, 2.25 to 2.75 sil.	20.50 to 21.00
Basic	20.00 to 20.50
Charcoal, warm blast	30.00

Steel.—Steady production, at high speed, and reasonable sales, marks the conditions of the steel market South. Wire and nails are especially strong. The season for the manufacture of cotton ties will soon be at hand and prospects are a great tonnage in this product will be sold. Steel bars are quoted at 2.25c., Birmingham.

Cast Iron Pipe.—Winter buying of large size cast iron pipe has been almost as good as expected and indications now are that the several plants manufactur-

ing gas and water pipe will operate steadily. The orders in hand and in sight will keep the plants busy until spring and already the prospects are for an active demand when the weather is more favorable throughout the country. The pipe quotations are still on a basis of $40 per ton, 6-in. and over.

Coke.—The coke market in the Birmingham district is still strong and the output is now being cared for. The surplus in the hands of the iron and steel manufacturers is being held for future use. One of the iron companies is having some coke made at an independent by-product coke oven plant, its own by-product ovens not meeting all demands. The coke prices remain the same as they have been for some time, ranging from $4.50 to $5 per ton for foundry coke.

Old Material.—Much scrap iron and steel is moving between dealers and consumers in this district, a little buying is going on and unfilled tonnage of some consequence yet. The quotations are unchanged for the week.

We quote per gross ton, f.o.b. Birmingham district yards, as follows:

Cast iron borings, chemical	$15.00 to $16.00
Heavy melting steel	15.00 to 15.50
Railroad wrought	14.00 to 15.00
Steel axles	18.00 to 19.00
Iron axles	19.00 to 20.00
Steel rails	15.00 to 15.50
No. 1 cast	17.00 to 17.50
Tramcar wheels	17.00 to 17.50
Car wheels	16.00 to 17.00
Stove plate	15.00 to 16.00
Machine shop turnings	8.00 to 9.00
Cast iron borings	8.00 to 9.00
Rails for rolling	15.50 to 16.50

Buffalo

Buying of Pig Iron Curtailed but Recent Prices Are Maintained

BUFFALO, Jan. 20.—Inquiry for pig iron has slumped and placement is not so heavy as during the previous week. Two malleable inquiries, one for 600 tons and the other for 500 tons, are the features in an aggregate of 5000 tons sought. A 3000-ton inquiry for basic, that of the Washburn Wire Co., is believed to have been placed, but not locally. This inquiry was mentioned last week. The largest booking for the week was that of one local furnace which took a total of 3000 tons. The $23 price for No. 2 plain, 1.75 to 2.25 silicon, is well sustained, no wavering having been noted. The differentials are also maintained. This price is being named on second quarter as well as first quarter iron. The Lackawanna plant has increased its furnaces in blast to seven.

We quote prices f.o.b. gross ton, Buffalo, as follows:

No. 2 plain, sil. 1.75 to 2.25	$23.00
No. 2X foundry, sil. 2.25 to 2.75	23.50
No. 1 foundry, sil. 2.75 to 3.25	24.50
Malleable, sil. up to 2.25	23.00
Basic	23.00
Lake Superior charcoal	29.28

Finished Iron and Steel.—Mills are maintaining satisfactory operations, and specifications on orders are coming in at a good rate. Bar business is good and mills are awaiting developments looking to an increase in the 2.365c. price. Shapes are in good demand and sheet makers say the specifications are scattered satisfactorily over a wide range. In sheets, almost every user is covered by contract. Wire business holds up very well, with operations at 100 per cent. The bolt and nut market is firm, with some speculation as to price revision in case the bar price is increased. Fabricators report little in the way of sizable inquiry, though one job taken by a local shop was for 250 tons of structural steel for an addition to the Portland Cement Co. plant at Portland Point. The new Shea Theater will require 200 tons of reinforcing bars.

Old Material.—Recent heavy purchasing by the Lackawanna plant of the Bethlehem Steel Co. will serve to keep the market in line for the next few weeks. Dealers will be active for a considerable time, buying to satisfy this purchase, which is said to approximate 25,000 to 30,000 tons. The heavy melting steel market is firm at $19.50 to $20. Cleveland is still buying turnings. Dealers are offering $18 to $18.50, Pittsburgh, for machine shop turnings, which means a price of $15 to $15.50, Buffalo. There is some buying of angle bars, short steel rails and special grades of foundry steel, as high as $23 a ton being paid for some of the latter. Some buying of iron axles at $30.50 to $31.50 and steel axles at $20.50 to $21 has taken place.

We quote f.o.b. gross ton, Buffalo, as follows:

Heavy melting steel	$19.50 to $20.00
Low phosphorus, 0.04 and under	22.50 to 23.50
No. 1 railroad wrought	16.50 to 17.00
Car wheels	20.50 to 21.00
Machine shop turnings	15.00 to 15.50
Cast iron borings	14.50 to 15.00
No. 1 busheling	18.50 to 19.50
Stove plate	16.50 to 17.00
Grate bars	14.50 to 15.00
Bundled sheets	14.00 to 15.00
Hydraulic compressed	18.50 to 19.00
Railroad malleable	20.50 to 21.00
No. 1 machinery cast	18.50 to 19.00
Iron axles	30.50 to 31.50
Steel axles	20.50 to 21.00

San Francisco

Structural Activity Continues, but General Buying Is Light—Prices Firm

SAN FRANCISCO, Jan. 17 (*By Air Mail*).—Structural activity continues as the most important feature of the present market, although the aggregate tonnage of structural awards during the week amounted to only 3235 tons. Jobs calling for more than 30,000 tons are still pending, however, and a number of them are expected to be placed during the course of the next few weeks. Contracts for 3783 tons of reinforcing bars were also let during the week. Other awards include 195 tons of plates and 245 tons of cast iron pipe. Prices are very firm. The only price advance during the week, however, was $5 in the price of ferromanganese, which is now quoted at $117.50.

General buying is light, primarily because of the heavy bookings at the close of the year, and it is yet too early for interest to develop for the second quarter. There seems to be little inclination on the part of buyers to test present quotations, probably because there have been several indications of stiffening tendencies, which would very likely become stronger if nourished by inquiries.

Pig Iron.—The amount of buying that is being done is confined to small lots. Orders for an aggregate of about 1000 tons of domestic foundry iron were taken in Los Angeles during the past ten days. Prices are holding firm for both domestic and foreign irons, and there is talk of higher levels for second quarter delivery. Current quotations are as follows:

	Per Ton
*Utah basic	$27.25 to $28.25
*Utah foundry, sil. 1.75 to 2.25	27.50 to 28.50
**Scotch foundry	29.50 to 30.00
**English foundry	28.50 to 30.00
**Belgian foundry	26.00 to 28.00
**Indian foundry	26.00 to 28.00
*Dutch foundry	26.00
*Birmingham, Ala., foundry, sil. 2.75 to 3.25	31.00

*Delivered in San Francisco.
**Duty paid, f.o.b. cars, San Francisco.

Structural Shapes.—Awards during the week called for 3235 tons, and a number of large projects are pending. Herrick Iron Works was low bidder for 105 tons on the Atkins Theater job in Berkeley. The American Falls Dam project at American Falls, Idaho, has practically been taken out of the local market by the announcement that the Federal Government will supply the 500 tons of structural steel to the contractors, probably from the East. The same announcement applies to 550 tons of reinforcing bars. Prices are very firm at 2.50c. to 2.56c., c.i.f. The largest single award of the week was for an apartment house in San Francisco, 2200 tons, awarded to Dyer Bros.

Ferroalloys.—A price advance of $5 was made effective in this market Jan. 14 in ferromanganese, making the present quotation $117.50. An order for 50 tons of ferromanganese was recently placed by the Southern Pacific. The best price for 50 per cent Swedish ferrosilicon is $86, duty paid, f.o.b. cars. A quotation of $80 has been made for 45 per cent ferrosilicon but no orders have been taken.

Bars.—A number of reinforcing jobs that have been pending for some time were placed during the week, the aggregate quantity being 3783 tons. There are still a number of fairly good size jobs pending. Bids are expected to be opened shortly for about 2000 tons of reinforcing bars by the Navy Department, Bureau of Docks, Bremerton Navy Yard, Seattle, Wash. Prices are firm at 3.35c., base carload, and 3.80c. base, l.c.l Soft steel bars are 2.55c. to 2.60c. base, and soft steel bands are 3.30c. to 3.35c., base. Reinforcing awards include:

General Petroleum Co., Parr Terminal, Oakland, 400 tons, to Edw. L. Soule & Co.

Dudley Stone School, San Francisco, 190 tons, to W. S. Wetenhall Co.

State Street Bridge, Los Angeles, 138 tons, to unknown fabricator.

Apartment house on Lake Merritt, Oakland, 230 tons, to Edw. L. Soule & Co.

Dumbarton Bridge, 600 tons, to Edw. L. Soule & Co.

Pier 50, San Francisco, 950 tons, to Edw. Soule & Co.

Terminal Warehouse, China Basin, San Francisco, 950 tons, to Edw. L. Soule & Co.

Alaska Packers Ass'n., wharf, Alameda, 225 tons, to Edw. L. Soule & Co.

Denke Garage, San Francisco, 100 tons, to Gunn, Carle & Co.

Plates.—Interest is somewhat mild, although several jobs are pending. The only award of more than 100 tons during the week was let to the Hanlon Dry Dock & Shipbuilding Co., by the Associated Oil Co., for one 2500-bbl. barge involving about 145 tons. The Pacific Gas & Electric Co. has inquired for about 480 tons for three gas generators. Prices are firm at 2.50c. to 2.56c., c.i.f.

Cast Iron Pipe.—Prices show signs of stiffening, although the demand at present is not notably active. Current quotations are $53 to $54 base, delivered in San Francisco. The United States Cast Iron Pipe Co. was low bidder on the Bureau of Water Works, Portland, Ore., job calling for 2500 tons of cast iron pipe and 50 tons of cast iron specials.

Warehouse Business.—Since the price advance of a week ago prices have held very firm, and the volume of demand has somewhat increased. Prevailing quotations are as follows:

Merchant bars, $3.15 base, per 100 lb.; soft steel bands, $4.00 base per 100 lb.; angles, ¼ in. and heavier x 1½ in. to 2¾ in., inc., $3.15 base, per 100 lb.; channels and tees, ¾ in. to 2¾ in., inc., $3.75 base, per 100 lb.; angles, beams and channels, 3 in. and larger, $3.15 base, per 100 lb.; tees, 3 in. and larger, $3.35 base, per 100 lb.; universal mill plates, ¼ in., and heavier, stock lengths, $3.15 base, per 100 lb.; spring steel, ¼ in. and thicker, $6.15 base, per 100 lb.; No. 10 blue annealed sheets, $4.20 base, per 100 lb.; No. 28 black sheets, $5.25 base, per 100 lb.; No. 28 galvanized sheets, $6.25 base, per 100 lb.; No. 28 galvanized corrugated sheets, $6.30 base, per 100 lb.

Coke.—Interest is principally confined to small lots, although there has been more activity during the past week than at any time since the first of the year. English beehive is $16 to $18 at incoming dock, and English by-product is $14. Birmingham, Ala., by-product is $18.50 to $20.50 delivered, West Virginia beehive is $28 delivered, and Wise County, Va., beehive is $22 delivered.

Old Material.—No change has been made in prices and the demand is still somewhat hesitant. There has been a little more active interest in Los Angeles since the first of the year, the prevailing quotation on heavy melting steel there being about $10.

Prices for scrap delivered to consumer's yards are as follows:

	Per Gross Ton
No. 1 heavy melting steel	$11.00 to $12.00
Scrap rails, miscellaneous	11.00 to 12.00
Rolled steel wheels	11.00 to 12.00
Couplers and knuckles	11.00 to 12.00
Mixed borings and turnings	6.00 to 6.50
Country mixed scrap	8.50 to 9.00

Cleveland

Automobile Industry Pursues Cautious Policy —Pig Iron Fairly Active

CLEVELAND, Jan. 20.—Some mills are still getting a good volume of new business, largely in steel bars. Others report an improvement in small lot orders but they are getting very little inquiry of importance. A few consumers who bought conservatively are placing orders covering first quarter requirements. Specifications are coming in freely for February quotas. Jobbers are ordering fairly well and specifications are good for bolt and nut and cold-drawn steel makers.

The one product that shows some sign of dragging is sheets, for which January specifications have not been up to expectations. This is probably due to the fact that the automobile industry is still moving very cautiously and is not buying far ahead. Generally the market is in a very satisfactory situation. With mills comfortably filled and consumers getting material as needed without crowding for deliveries, prices on the heavier material are firm with no apparent disposition by mills to make further advances. On sheets and strip steel there is still some price irregularity with a production capacity somewhat in excess of the demand. The Nickel Plate Railroad has placed 22,000 tons of rails for 1925, but the allocation of this tonnage among the mills sharing the business has not been announced. The Rock Island Railroad is inquiring for ten switch engines requiring 400 tons of plates. Lake ship yards are figuring on three freight boats, one of which will probably be placed this week.

Pig Iron.—Cleveland interests sold slightly over 20,000 tons of pig iron during the week, showing a volume of business about equal to the previous week. Sales were all for the second quarter aside from a few small lot sales for prompt shipment. Although a second quarter buying movement has not gotten under way in good volume, considerable inquiry is coming out for that delivery. The Worthington Pump & Machinery Corporation is inquiring for 7000 to 8000 tons of foundry iron for its various plants and another 5000-ton lot is pending. Fair inquiry is coming from New England. In the steel making grades, no sales are reported, but the American Steel Foundries is inquiring for 3000 to 5000 tons of basic iron for its Alliance, Ohio, plant for February and March shipment. The market is firm, with no marked change in the general price situation. The Lake furnace price is established at $23, with one or two producers trying to get $23.50 in some cases. One local interest has advanced its price to $23.50 for both Cleveland and outside shipment and another local producer who has been asking $24 for Cleveland delivery has sold a several hundred ton lot at that price. The Valley market now seems established at $23, so that it seems probable that $24 will soon become the ruling price in Cleveland. It seems doubtful whether basic iron can be bought below $22.50. Southern foundry iron ranges from $20 for first quarter to $20.50 to $21 for the second quarter. Shipments have improved over December and foundries generally report an increase in melt, although large production foundries engaged in automobile work have not yet increased operations to the extent that they had expected.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a $3.02 freight rate from Jackson and $6 rate from Birmingham:

Basic, Valley furnace	$22.00 to $22.50
N'th'n No. 2 fdy., sil. 1.75 to 2.25	24.00
Southern fdy., sil. 1.75 to 2.25	26.01 to 26.51
Malleable	24.00
Ohio silvery, 8 per cent	33.52
Standard low phos., Valley furnace	29.00

Iron Ore.—There is some demand for dock ore for filling in and several sales in small lots were made during the week. A few inquiries have come out for 1925 prices, but these are believed to be only for in-

ventory purposes. The first definite market inquiry during the past two years came from the Ford Motor Co. and a Ford inquiry last year brought out the season's price. However, ore men are advised that the Ford inquiry for 1925 will not be out for several weeks.

The consumption of Lake Superior ore during December amounted to 4,451,866 tons, a gain of 853,140 tons over November. On Dec. 31 there were 202 furnaces in blast using Lake ore, or a gain of 25 for the month. The amount of ore on hand at furnaces and Lake Erie docks Jan. 1 was 36,359,975 tons, a decrease of more than 2,000,000 tons as compared with Jan. 1 a year ago, when the amount was 38,635,051 tons.

Fluorspar.—The market is inactive, as consumers generally place contracts in December for the first quarter. The price is firm at $20 for 85 per cent material.

Bolts, Nuts and Rivets.—Bolt and nut makers are now getting a fair volume of specifications on first quarter contracts and with the large volume of specifications placed in December against last quarter contracts have a good volume of business on their books. New buying is light, as the trade is about all under contract. Prices are firm. Rivet specifications on first quarter contracts are being placed in good volume by car shops, locomotive builders and shipbuilders. The regular price is being firmly maintained.

Structural Material.—The Ford Motor Co., Detroit, took bids during the week for 12,000 tons for its open-hearth plant. An office building and theater in Detroit requiring 3000 tons was placed with the Whitehead & Kales Iron Works Co. This project originally included a hotel, all calling for 7000 tons, but the hotel part has been given up for the present. The market is firm at 2.10c., Pittsburgh.

Semi-Finished Steel.—Mills continue to get good specifications, but there is little new demand. Prices are firm with $40, Cleveland and Youngstown, the usual quotation on sheet bars. We note the sale of 1500 tons of 1½-in. billets by a local mill at $41.50, Cleveland.

Steel Bars and Plates.—Plates are firmer and some of the smaller mills are able to take a fair volume of business at 2.10c., Pittsburgh, although 2c. is the common price for good lots. Steel bars are firm at 2.10c., Pittsburgh.

Jobbers quote steel bars, 3.10c.; plates and structural shapes, 3.20c.; No. 28 black sheets, 4.35c.; No. 28 galvanized sheets, 5.45c.; No. 10 blue annealed sheets, 3.45c. to 3.60c.; cold-rolled rounds, 4c.; flats, squares and hexagons, 4.50c.; hoops and bands, 1 in. and wider and 20 gage and heavier, 3.35c.; narrower than 1 in., all gages, 4.35c.; No. 9 annealed wire, $3.15 per 100 lb.; No. 9 galvanized wire, $3.60 per 100 lb.; common wire nails, $3.25 base per 100 lb.

Sheets.—Demand is light. While some mills are filled with orders, others are complaining that they are unable to get specifications on January quotas of first quarter contracts. The automotive industry is specifying cautiously and the time for auto body sheets is not up to capacity of the producers. Black sheets lack firmness, being offered at 3.50c. for the first quarter and there is some shading to 4.60c. on galvanized sheets. Blue annealed sheets are firm.

Strip Steel.—While mills are well filled with orders, there is still irregularity in wide strip that competes with light plates and blue annealed sheets and 2.25c. is being shaded, although some mills are holding to 2.40c. Hoops and bands are firm with 2.60c. and 2.50c. as the general quotations. One Valley district mill has advanced its price on cold-rolled strip steel to 4.15c. However, this is still commonly quoted at 4c., Cleveland.

Coke.—The demand for foundry coke is limited to small lots for prompt shipment. Although furnace coke is weaker, foundry grades are unchanged at $5 to $5.75 for standard Connellsville foundry coke. Wise County foundry coke is quoted at $5.50 to $6.

Old Material.—The market quieted down the past week, following considerable activity during the preceding week and prices have eased off 50c. to 75c. a ton on heavy melting steel and 25c. to 50c. a ton on several other grades. In the Valley district, heavy melting steel is being offered at $22, at which one mill bought 1500 tons from a Cleveland dealer during the week, as compared with a $22.50 price that had been prevailing. Purchases by Cleveland consumers during the recent buying movement aggregated about 50,000 tons. However, the volume of business this month has not come up to the expectation of some dealers. Yard stocks are now being sold by some of the dealers, but others are still holding their stocks.

We quote dealers' prices f.o.b. Cleveland per gross ton:

Heavy melting steel	$19.75 to $20.00
Rails for rolling	19.75 to 20.00
Rails under 3 ft.	22.00 to 22.50
Low phosphorus melting	22.00 to 22.25
Cast iron borings	16.50 to 17.00
Machine shop turnings	16.50 to 16.75
Mixed borings and short turnings	16.50 to 16.75
Compressed sheet steel	17.75 to 18.00
Railroad wrought	17.00 to 17.50
Railroad malleable	22.00 to 22.50
Light bundled sheet stampings	15.50 to 16.00
Steel axle turnings	18.00 to 18.50
No. 1 cast	20.00 to 20.50
No. 1 busheling	16.25 to 16.50
Drop forge flashings	15.00 to 15.25
Railroad grate bars	16.50 to 17.00
Stove plate	16.50 to 17.00
Pipes and flues	14.75 to 15.00

Philadelphia

New Business Confined to Small Lots—Pig Iron Firm, but Foreign Iron More Active

PHILADELPHIA, Jan. 20.—Renewal of active buying is evidently still awaiting an improvement in the volume of business in iron and steel consuming industries. This situation permeates the whole field. Steel mills are curtailing purchases of scrap and other raw materials pending further and heavier bookings of their products and foundries and other consumers of pig iron are amply covered for present requirements and not inclined to anticipate future consumption until the future is more clearly defined. Some sellers are frank in their expression of disappointment that renewed activity has not yet appeared, but a gradual improvement is still expected to develop as consumers come closer to the second quarter, for which they are practically without tonnage. In the meantime prices are being held firm in all lines but scrap and specifications are reported coming in on contracts in satisfactory volume.

Transactions in the finished material market are in the small tonnages common in the months before November of last year. The pig iron market developed only one sizable piece of business in the past week. The Pennsylvania Railroad has been maintaining activity in a wide range of products since the first of the year and is expected to come out this week with its 1925 rail requirement, 100,000 tons.

Pig Iron.—The further purchase by the Pennsylvania Railroad of 4000 tons of No. 2 plain and No. 2X foundry iron was the sole tonnage of any size placed during the week. According to reports this order, which was divided among central and eastern Pennsylvania furnaces, the leading independent interest taking a part, went at $23.50 per ton base, eastern Pennsylvania, and lower than this from the central Pennsylvania furnaces. Pig iron from European furnaces is occupying a slightly more prominent position in current business. Thus far sales have been at within 50c. per ton of the eastern Pennsylvania market. About 300 tons of No. 2X recently went to a foundry at $24.50 per ton, delivered. Purchases of foreign pig iron have been heavier in the New England district than elsewhere, but orders have been largely confined to a few hundred tons each. It is estimated that recent importations and tonnages in process of shipment range from 12,000 to 15,000 tons of continental iron. It is noteworthy that during the past week slightly less than 5000 tons of French pig iron came into the Port of Philadelphia. While a large part of the continental iron brought in has been high silicon, medium phosphorus foundry, there has been a not in-

considerable tonnage of low phosphorus iron and a small amount of high phosphorus, ranging up to 1.80 per cent, sold principally to stove founders in New England.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76c. to $1.63 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$24.26 to $25.13
East. Pa. No. 2X, 2.25 to 2.75 sil.	25.01 to 25.88
East. Pa. No. 1X	26.01 to 26.88
Virginia No. 2 plain, 1.75 to 2.25 sil.	29.17 to 29.67
Virginia No. 2X, 2.25 to 2.75 sil.	29.67 to 30.17
Basic delivered eastern Pa.	24.25 to 24.75
Gray forge	24.00 to 24.50
Malleable	24.50 to 25.00
Standard low phos. (f.o.b. furnace)	25.50 to 26.50
Copper bearing low phos. (f.o.b. furnace)	25.50 to 26.00

Billets.—Demand is still light but slight increase in consumption by makers with their own finishing mills is holding the price at $37.50 to $38 per ton, Pittsburgh, for rerolling billets and $42.50 to $43 per ton, Pittsburgh, for forging quality.

Old Material.—In the face of a determination by buyers to buy at lower prices, at the same time not anticipating the future until it has become less uncertain, the scrap market has developed an undertone of weakness and reductions on many grades. Only nominal quotations are possible on certain items, in which there has been no recent activity. On others, such as heavy melting steel, actual transactions, have registered a downward movement this week. No. 1 heavy melting steel has declined from the high point of $21 reached a few weeks ago. A large eastern Pennsylvania consumer recently closed on a total of about 20,000 tons at $19 per ton, and has since purchased smaller lots at $18.50 and $18 per ton. Another eastern Pennsylvania consumer, not long ago the purchaser of about 5000 tons at $21, has closed on 5000 tons in the past week at $20 per ton. An eastern Pennsylvania consumer of bundled sheets, machine shop turnings and stove plate has reduced offering prices by 50c. per ton, and brokers are offering to buy for this delivery on the new basis. Borings and turnings show a slight revision upward, recent purchases by a large consumer justifying a change from $13.50 to $15.50 to a basis of $14 to $15 per ton, delivered. A Claymont consumer of heavy melting steel has temporarily suspended shipments on its contracts and some of this steel has been diverted to other consumers at $20 per ton.

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	$18.00 to $20.00
Scrap rails	19.00 to 20.00
Steel rails for rolling	20.00 to 21.00
No. 1 low phos., heavy 0.04 and under	24.00 to 25.00
Couplers and knuckles	22.50 to 23.50
Rolled steel wheels	22.50 to 23.50
Cast-iron car wheels	19.50 to 20.00
No. 1 railroad wrought	21.00 to 22.00
No. 1 yard wrought	18.00 to 19.00
No. 1 forge fire	17.00 to 17.50
Bundled sheets (for steel works)	16.50 to 17.00
Mixed borings and turnings (for blast furnace use)	14.00 to 15.00
Machine shop turnings (for steel works use)	16.50 to 17.00
Machine shop turnings (for rolling mill use)	17.00 to 18.00
Heavy axle turnings (or equivalent)	18.50 to 19.00
Cast borings (for steel works and rolling mill)	16.00 to 16.50
Cast borings (for chemical plants)	21.00 to 21.50
No. 1 cast	20.00 to 20.50
Heavy breakable cast (for steel plants)	18.00 to 19.00
Railroad grate bars	17.00 to 18.00
Stove plate (for steel plant use)	16.50 to 17.00
Wrought iron and soft steel pipes and tubes (new specifications)	18.00 to 18.50
Shafting	25.00 to 25.50
Steel axles	25.00 to 26.00

Bars.—Purchases of steel bars are confined to small lots, insufficient in total to warrant continuation of a high operating rate beyond the first quarter unless larger tonnages are forthcoming before long. Prices, however, are firm at 2.10c. per lb., Pittsburgh.

Shapes.—Structural projects are still small, but demand continues in fair volume with 2.10c. per lb., Pittsburgh, generally quoted, with a lower price obtainable on the more satisfactory tonnages offered.

Plates.—Demand has dropped off somewhat, with most consumers well covered on present requirements, but the market is firm at 2c. to 2.10c. per lb., Pittsburgh, makers showing no inclination to drop below the 2c. minimum, even on the more satisfactory inquiries.

Ferromanganese.—Inquiries for second quarter requirements have not yet appeared, but prices are firm at $115 per ton, seaboard or domestic furnace. A moderate volume of carload lots and orders ranging up to 100 tons is reported by both foreign and domestic sellers.

Imports.—In the week ended Jan. 17 a total of 8243 gross tons of pig iron came into the Port of Philadelphia; 4911 tons from France; 1782 from India and 1550 from the United Kingdom. Iron ore imports totaled 13,100 gross tons; 7100 tons from French Africa and 6000 tons from Spain. A total of 112 gross tons of steel angles came in from Belgium.

RAILROAD EQUIPMENT BUYING

Orders for 1200 Cars and Inquiries for 1700—Some Locomotive Business

Railroad equipment business of the past week is summed up by saying 1200 cars were bought, 1712 were put under inquiry, 14 locomotives were purchased and 12 were added to the list under negotiations. Freight cars in need of repair, Jan. 1, numbered 190,979, or 8.3 per cent of the total number, according to reports of the American Railway Association. Some of the items of the week are:

The Charleston & Western Carolina is in the market for 100 single sheathed box cars, 40 tons capacity.

The Morrell Refrigerator Line has awarded 100 refrigerator cars to the American Car & Foundry Co.

The Phillips Petroleum Co. has purchased 100 insulated tank cars from the General American Tank Car Corporation.

The Union Railroad is inquiring for 12 70-ton gondola cars.

The Cuba Railroad has awarded six Mikado type locomotives to the American Locomotive Co.

W. R. Grace & Co., New York, exporters, are in the market for a 0-40 locomotive for export.

The Cornwall Railroad is in the market for one Consolidation type locomotive.

The Texas City Terminal has purchased a 6-wheel switching locomotive from the Baldwin Locomotive Works.

The Atlanta & West Point Railroad has placed two Mikado type locomotives with the Lima Locomotive Works.

The Oahu Railway & Land Co., Honolulu, Hawaii, has purchased two Mikado type locomotives from the American Locomotive Co.

The Anderson Middleton Lumber Co. has placed one Prairie type locomotive with the Baldwin Locomotive Works.

The Michigan Limestone & Chemical Co. has placed two heavy switching engines with the Lima Locomotive Works.

The Rock Island Lines are inquiring for 1200 box, 400 general service cars and 10 8-wheel switching locomotives.

The New York Central has equally divided an order for 1000 55-ton gondola cars between the American Car & Foundry Co. and the Pullman Car & Mfg. Corporation. The same road has placed 29 multiple unit suburban cars with the Standard Steel Car Co.

Scrap Declines at Detroit

DETROIT, Jan. 20.—Most mills and furnaces having some of their waste material bought for the first quarter have shown a disposition to stay out of the market at present prices for their full requirements, with the result that there has been a general decline in the Detroit market. Automobile cast is the one exception, due to the fact that the shops producing automobile castings will pay a premium for this material and are in production ahead of actual car production.

The following prices are quoted on a gross ton basis f.o.b. producers' yards, excepting stove plate, No. 1 machinery cast and automobile cast, which are quoted on a net ton basis:

Heavy melting steel	$18.00 to $18.50
Shoveling steel	18.00 to 18.50
Borings and short turnings	14.00 to 14.50
Long turnings	13.75 to 14.50
No. 1 machinery cast	18.50 to 19.00
Automobile cast	22.00 to 23.00
Hydraulic compressed	16.50 to 17.25
Stove plate	16.50 to 17.50
No. 1 busheling	14.50 to 15.00
Sheet clippings	13.50 to 14.25

NON-FERROUS METALS

The Week's Prices

Cents per Pound for Early Delivery

	Copper, New York		Straits Tin (Spot)	Lead		Zinc	
Jan.	Lake	Electrolytic*	New York	New York	St. Louis	New York	St. Louis
14....	15.25	14.87½	58.50	10.60	10.35	8.25	7.90
15....	15.25	14.87½	58.12½	10.60	10.35	8.25	7.90
16....	15.12½	14.75	57.12½	10.60	10.35	8.15	7.80
17....	15.12½	14.75	....	10.60	10.35	8.15	7.80
19....	15.12½	14.75	57.00	10.60	10.35	8.15	7.80
20....	15.12½	14.75	56.00	10.60	10.35	8.15	7.80

*Refinery quotation; delivered price ¼c. higher.

New York

NEW YORK, Jan. 20.

The markets are all exceedingly quiet with a tendency to lower prices in some of them. Copper is not active and is a little lower. Moderate buying of tin has appeared in a receding market. The situation in lead is practically unchanged. Prices for zinc are on the downward grade.

Copper.—While the electrolytic copper market is not characterized as weak by most producers, business is being done at slightly lower levels than a week ago. Demand, however, is very moderate and this is being satisfied by some interests such as custom smelters at 15c., delivered. There are some large producers, however, who are still refusing to sell at less than 15.12½c., delivered. Consumers are evidently fairly well covered for the first quarter and are not yet ready to make extended purchases beyond that delivery. There is also a distinct lull in foreign demand, with one report that the metal has sold as low as 14c. to 14.75c., f.a.s. While the market may go slightly lower than 15c., delivered, trade opinion is to the effect that the present reaction will be very moderate. Lake copper is quoted at 15.12½c. to 15.25c., delivered.

Tin.—Demand for Straits tin has been spasmodic but in fairly good volume and total sales for the week covered by this report have been about 900 to 1000 tons. Consumers have purchased fairly liberally and are credited with about half of the total. On Jan. 14 about 200 tons changed hands, the market closing dull. Stagnation prevailed on Jan. 15, but on Jan. 16 from 500 to 600 tons changed hands. Yesterday the market was only moderately active with sales amounting to 100 to 150 tons. The market today has also been somewhat demoralized with spot Straits tin quoted at 56c., New York. The London market continues to decline and today prices are about £7 to £8 per ton less than a week ago, with spot standard quoted at £259, future standard at £263 and spot Straits at £262 5s. The Singapore price yesterday was £266 10s., a decline of nearly £10 in the week. The slump in London is not fully understood in this market though some consider it a bear raid. Arrivals thus far this month have been 5010 tons, with 8240 tons reported afloat.

Because of a typographical error the price of Straits tin at New York on Jan. 13 should have been 58.80c. instead of 59.80c.

Lead.—The lack of broadness in trading and the continued scarcity of the metal make judgment of the market unusually difficult. The leading interest continues to quote 10.50c., New York, as its contract price with sales in the outside market as high as 10.75c. At St. Louis the minimum price at which some business is being done is 10.25c., with higher prices in all other cases.

Zinc.—The market is weaker, due largely to a slump in export demand. Domestic buying is also light. Prime Western for early delivery is quoted at 7.80c., St. Louis, or 8.15c., New York.

Nickel.—Wholesale lots of shot and ingot nickel are quoted unchanged at 29c. to 30c. per lb., with electrolytic nickel at 33c.

Antimony.—The disturbances in China continue to have their influence in this market so that the Chinese metal is still quoted at 17.37½c. to 17.50c., New York, for prompt and early delivery.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted at 27c. to 28c. per lb., delivered.

Old Metals.—Prices are unchanged and holders do not seem inclined to sell on the present basis. Dealers' selling prices are as follows in cents per lb.:

Copper, heavy and crucible	14.50
Copper, heavy and wire	13.50
Copper, light and bottoms	11.75
Heavy machine composition	11.00
Brass, heavy	9.50
Brass, light	8.00
No. 1 red brass or composition turnings	10.25
No. 1 yellow rod brass turnings	10.00
Lead, heavy	9.50
Lead, tea	8.25
Zinc	5.50
Cast aluminum	18.50
Sheet aluminum	18.50

Large Grinding Machines for Steel Mills

The Norton Co., Worcester, Mass., is building three of the largest sizes of roll grinding machines for use in steel mills for grinding the cylindrical bodies of chilled iron rolls, such as are used in the hot-rolling of plates, sheets and strips, in preparation for final rolling into special shapes. One is for the Sparrows Point, Maryland, plant of the Bethlehem Steel Co. and another for the Birmingham Work of the Tennessee Coal, Iron & Railroad Co. Both of these machines will swing rolls up to 50 in. diameter and 14 ft. length. The third machine, for the Homestead Works of the Carnegie Steel Co., at Munhall, Pa., will be larger than the others, with same swing, but with a capacity up to 21 ft. in length. The weight of such a machine ranges from 50 to 60 tons.

The Norton Co. has in the works an order for 37 grinding machines for the Nash Motor Co., for its Kenosha and Milwaukee plants and for that of its subsidiary, the Ajax Motor Co., at Racine, Wis. The order includes a battery of six B type model 81 double head pin-grinding machines for grinding the pins of crankshafts, a battery of machines for grinding integral crankshaft bearings, and machines for grinding integral camshafts and cylindrical parts such as pistons, pinion shafts and transmission brake drums.

Kent Machine Co. Adds New Line

The Kent Machine Co., Kent, Ohio, has purchased from the National Acme Co., Cleveland, all drawings, patterns and tools for manufacturing, also all rights to manufacture under patents, the complete line of Namco auxiliary machinery manufactured by the latter during the past few years. This line was developed by the Acme company for secondary operations in its screw products plant and the demand for the machines by the automatic screw machine users caused them to be placed on the market. Several varieties are included, among which are bar pointing machines, automatic stud threaders in two sizes, small tool grinders, single spindle drillers, six-spindle semi-automatic drillers, semi-automatic screw slotters in two sizes and two-spindle bolt threaders in two sizes.

Hearing in Bethlehem Merger Case to Be Resumed

WASHINGTON, Jan. 20.—It was announced today at the offices of the Federal Trade Commission that hearings in the Bethlehem Steel merger case will be resumed at 10 a. m., Thursday, Jan. 29, at room 311, Federal Building, Philadelphia. The examiner is George McCorkle, while the attorney for the commission is Baldwin B. Bane.

Beehive coke produced in the week ended Jan. 10 is reported by the U. S. Geological Survey at 266,000 tons, compared with 257,000 tons in the previous week and with 258,000 tons in the week ended Jan. 12, 1924.

Prices of Finished Iron and Steel Products (Carload Lots)

Tank Plates

F.o.b. Pittsburgh mill, base, per lb.....2c. to 2.10c.
F.o.b. Chicago, base, per lb.....2.20c.

Structural Shapes

F.o.b. Pittsburgh mills, base, per lb.....2.10c.
F.o.b. Chicago, base, per lb.....2.20c.

Iron and Steel Bars

Soft steel bars f.o.b. P'gh mills, base, per lb.....2.10c.
Soft steel bars f.o.b Chicago, base, per lb.....2.10c.
Reinforcing steel bars f.o.b. P'gh mills, base, per lb....2.10c.
Rails steel bars f.o.b. Chicago district mills, base, per lb...2c.
Common iron bars f.o.b. Chicago, base, per lb.....2c.
Refined iron bars f.o.b. P'gh mills, base, per lb..3.00c. to 3.10c.
Common iron bars, eastern Pa. mill, base, per lb.....2.10c.

Hot-Rolled Flats

(Pittsburgh)

Hoops, base, per lb.....2.50c.
Bands, base, per lb.....2.40c. to 2.50c.
Hoops and bands, narrower than 1-in., base per lb.....2.75c.
Strips, 10 in. and wider, base, per lb.....2.25c. to 2.35c.
Strips, less than 10 in. wide to 3 in.....2.40c. to 2.50c.
Strips, 3 in. wide and less, base, per lb.....2.50c. to 2.60c.

Cold-Finished Steel

Screw stock and shafting, f.o.b. P'gh mills, base, per lb..2.80c.
Screw stock and shafting, f.o.b. Chicago, base, per lb..2.80c.
Screw stock, Worcester mills, base, per lb.....3.00c.
Screw stock, base, per lb., Cleveland.....2.85c.
Shafting, ground, f.o.b. mill, base, per lb.....3.20c.
Strips, f.o.b. P'gh mills, base, per lb.....4.00c. to 4.15c.
Strips, f.o.b. Cleveland mills, base, per lb.....4c to 4.15c.
Strips, f.o.b. Chicago mills, base, per lb.....4.45c.
Strips, f.o.b. Worcester mills, base, per lb.....4.30c.

Wire Products

(To jobbers in car lots f.o.b. Pittsburgh and Cleveland)

Nails, base, per keg..... $2.85
Galvanized nails, 1-in. and longer, base plus..... 2.25
Galvanized nails, shorter than 1-in., base plus..... 2.50
Bright plain wire, base, No. 9 gage, per 100 lb..... 2.60
Annealed fence wire, base, per 100 lb..... 2.75
Galvanized wire No. 9, base, per 100 lb..... 3.20
Galvanized barbed, base, per 100 lb..... 3.55
Galvanized staples, base, per keg..... 3.55
Painted barbed wire, base, per 100 lb..... 3.30
Polished staples, base, per keg..... 3.30
Cement coated nails, base, per count keg..... 2.25
•Bale ties, carloads to jobbers....75, 15 and 5 per cent off list
•Bale ties, carloads to retailers....75, 10 and 6 per cent off list
Woven wire fence, base, per net ton to retailers.....67.00

Chicago district mill prices are $2 per ton above the foregoing and Chicago delivered prices are $3 per ton above the prices f.o.b. Cleveland and Pittsburgh. Birmingham mill prices $3 a ton higher; Worcester, Mass., mills $3 a ton higher on production of that plant, and Duluth, Minn., mills $2 a ton higher; Anderson, Ind., $1 higher.

•F.o.b. Cleveland.

Sheets

Blue Annealed
(base) per lb.

Nos. 9 and 10, f.o.b. Pittsburgh dist. mill.....2.70c.
Nos. 9 and 10 (base) per lb., f.o.b. Chicago dist. mills..2.80c.

Box Annealed, One Pass Cold Rolled

No. 28 (base) per lb., f.o.b. Pittsburgh dist. mill.....3.60c.
No. 28 (base) per lb., f.o.b. Chicago dist. mill.....3.70c.

Galvanized

No. 28 (base) per lb., f.o.b. Pittsburgh dist. mill.....4.75c.
No. 28 (base) per lb., f.o.b. Chicago dist. mill.....4.85c.

Tin-Mill Black Plate

No. 28 (base) per lb., f.o.b. Pittsburgh dist mill.....3.60c.
No. 28 (base) per lb., f.o.b. Chicago dist. mill.....3.70c.

Automobile Body Sheets

No. 22 (base) per lb., f.o.b. mill.....4.75c.

Long Ternes

No. 28 (base) 8-lb. coating, per lb., f.o.b. mill.....4.90c.

Tin Plate

Standard cokes, per base box f.o.b. Pittsburgh district mills.....$5.50
Standard cokes, per base box f.o.b. Chicago district mills 5.60
Standard cokes, per base box f.o.b. Elwood, Ind..... 5.60

Terne Plate

(F.o.b. Morgantown or Pittsburgh)
(Per Package, 20 x 28 in.)

8-lb. coating, 100 lb. base.....$11.20	20-lb. coating I. C....$15.50
8-lb. coating I. C.... 11.50	25-lb. coating I. C.... 17.00
15-lb. Coating I. C.... 14.35	30-lb. coating I. C.... 18.35
	40-lb. coating I. C.... 20.35

Rivets

Large, f.o.b. P'gh and Cleveland mills, base, per 100 lb..$2.60
Large, f.o.b. Chicago, base, per 100 lb..... 2.75
Small, f.o.b. P'gh and Cleveland mills
70, 10 and 5 per cent off list
Small (freight allowed within zone limits).....70 off list

Rails and Track Equipment

(F.o.b. mill)

Rails, standard, per gross ton.....$43.00
Rails, light, billet, base, per lb.....1.80c. to 1.90c.
Rails, light rail steel, base, per lb.....1.65c. to 1.75c.
Spikes, ⅝ in. and larger, base, per 100 lb.....$2.90 to $3.20
Spikes, ½ in. and smaller, base, per 100 lb..... 3.00 to 3.50
Spikes, boat and barge, base, per 100 lb..... 3.25
Track bolts, all sizes, base, per 100 lb..... 3.80 to 4.25
Tie plates, per 100 lb..... 2.35 to 2.50
Angle bars, base, per 100 lb..... 2.75

Welded Pipe

(F.o.b. Pittsburgh district mills)

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛	45	19½	¼ to ⅜.....	+11	+39
¼ to ⅜.....	51	25½	½	22	2
½	56	42½	¾	28	11
¾	60	48½	1 to 1½.....	30	13
1 to 3.....	62	50½			

Lap Weld

2	55	43½	2	23	7
2½ to 6.....	59	47½	2½	26	11
7 and 8.....	56	43½	3 to 6.....	28	13
9 and 10...	54	41½	7 to 12.....	26	11
11 and 12...	53	40½			

Butt Weld, extra strong, plain ends

⅛	41	24½	2 to 3.....	61	50½
¼ to ⅜.....	47	30½	¼ to ⅜.....+11		+54
½	53	42½	½	21	7
¾	58	47½	¾	28	12
1 to 1½.....	60	49½	1 to 1½....	30	14

Lap Weld, extra strong, plain ends

2	53	42	2	23	9
2½ to 4....	57	46½	2½ to 4.....	29	15
4½ to 6.....	56	45½	4½ to 6.....	28	14
7 to 8.....	52	39½	7 to 8.....	21	7
9 and 10....	45	32½	9 to 12.....	16	2
11 and 12...	44	31½			

To the large jobbing trade the above discounts are increased (on black) by one point, with supplementary discount of 5 per cent and (on galvanized) by 1½ points, with supplementary discount of 5 per cent.

NOTE—The above discounts on steel pipe also apply at Lorain and Youngstown, Ohio, and Wheeling, W. Va. Chicago district mills have a base 2 points less. Chicago delivered base 2½ points less.

Boiler Tubes

(F.o.b. Pittsburgh)

Lap Welded Steel		Charcoal Iron	
2 to 2¼ in.....	27	1½ in.....+18	
2½ to 2¾ in.....	37	1¾ to 1⅞ in.....+ 8	
3 in.....	40	2 to 2¼ in.....— 2	
3¼ to 3¾ in.....	42½	2½ to 3 in.....— 7	
4 to 13 in.....	46	3¼ to 4½ in.....— 9	

Beyond the above discounts, 5 fives extra are given on lap welded steel tubes and 2 tens on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes
Cold Drawn

1 in.....	55-58	3 and 3¼ in.....	36-39
1¼ and 1½ in.....	47-50	3½ and 3¾ in.....	37-40
1¾ in.....	31-34	4 in.....	41-44
2 and 2¼ in.....	22-25	4½ in. and 5 in.....	33-37
2½ to 2¾ in.....	32-35		

Hot Rolled

3 and 3¼ in.....	38-41	4 in.....	43-46
3½ in. and 3¾ in....	39-42		

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Carbon under 0.30 base.....85 to 87 per cent off list
Carbon 0.30 to 0.40 base.....83 to 85 per cent off list
Plus usual differentials and extra for cutting. Warehouse discounts range higher.

Seamless Locomotive and Superheater Tubes

Cents per Ft.		Cents per Ft.	
2-in. O.D. 12 gage....	15	2¼-in. O.D. 10 gage..	20
2-in. O.D. 11 gage....	16	3-in. O.D. 7 gage.....	35
2-in. O.D. 10 gage....	17	1½-in. O.D. 9 gage...	15
2¼-in. O.D. 12 gage..	17	5⅝-in. O.D. 9 gage...	55
2¼-in. O.D. 11 gage..	18	5½-in. O.D. 9 gage...	57

Prices of Iron and Steel Products and Raw Materials

Ores

Lake Superior Ores, Delivered Lower Lake Ports

Old range Bessemer, 55 per cent iron	$5.65
Old range non-Bessemer, 51½ per cent iron	4.90
Mesabi Bessemer, 55 per cent iron	5.40
Mesabi non-Bessemer, 51½ per cent iron	4.75

Foreign Ore, per Unit, c.i.f. Philadelphia or Baltimore

Iron ore, low phos., copper free, 55 to 58 per cent iron in dry Spanish or Algerian	9.00c. to 9.50c.
Iron ore, Swedish, average 66 per cent iron	9.50c.
Manganese ore, washed, 51 per cent manganese, from the Caucusus, nominal	42c.
Manganese ore, ordinary, 48 per cent manganese from the Caucasus	40c.
Manganese ore, Brazilian or Indian, nominal	42c.
Tungsten ore, high grade, per unit, in 60 per cent concentrates	$8.75 to $9.00
Chrome ore, basic, 48 per cent Cr_2O_3, crude, per ton, c.i.f., Atlantic seaboard	18.50 to 24.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS_2, New York	80c.

Coke and Coal

(Per Net Ton)

Furnace coke, f.o.b. Connellsville prompt	$3.85 to $4.00
Foundry coke, f.o.b. Connellsville prompt	4.75 to 5.25
Mine run steam coal, f.o.b. W. Pa. mines	1.50 to 2.10
Mine run coking coal, f.o.b. W. Pa. mines	2.00 to 2.10
Mine run gas coal, f.o.b. W. Pa. mines	2.25
Steam slack, f.o.b. W. Pa. mines	1.40 to 1.50
Gas slack, f.o.b. W. Pa. mines	1.50 to 1.60

Ferroalloys

Ferromanganese, domestic, 80 per cent, furnace, or seaboard, per ton	$115.00
Ferromanganese, foreign, 80 per cent, f.o.b. Atlantic port, duty paid	110.00 to 115.00
Ferrosilicon, 50 per cent, delivered	82.50 to 85.00
Ferrosilicon, 75 per cent	145.00 to 147.50
Ferrotungsten, per lb. contained metal	90c. to 95c.
Ferrochromium, 4 per cent carbon and up, 60 to 70 per cent Cr., per lb. contained Cr. delivered	11.50c
Ferrovanadium, per lb. contained vanadium	$3.50 to $4.00
Ferrocarbontitanium, 15 to 18 per cent, per net ton	200.00

Spiegeleisen, Bessemer Ferrosilicon and Silvery Iron

(Per gross ton furnace unless otherwise stated.)

Spiegeleisen, domestic, 19 to 21 per cent.....$33.00 to $34.00
Spiegeleisen, domestic, 16 to 19 per cent..... 32.00 to 33.00
Ferrosilicon, Bessemer, 10 per cent, $39.50; 11 per cent, $42; 12 per cent, $44.50; electric furnace ferrosilicon 10 to 11 per cent, $38, furnace, with an advance of $1 per unit for material above 10 per cent.
Silvery iron, 5 per cent, $27.00; 6 per cent, $28.00; 7 per cent, $29.00; 8 per cent, $30.50; 9 per cent, $32.50; 10 per cent, $34.50; 11 per cent, $37.00; 12 per cent, $39.50.

Fluxes and Refractories

Fluorspar, 80 per cent and over calcium fluoride, not over 5 per cent silica, per net ton, f.o.b. Illinois and Kentucky mines	$19.00
Fluorspar, 85 per cent and over calcium fluoride, not over 5 per cent silica, per net ton f.o.b. Illinois and Kentucgy mines	20.00
Fluorspar, foreign, 85 per cent calcium, fluoride, not over 5 per cent silica, c.i.f. Philadelphia, duty paid, per net ton	18.00

Per 1000 f.o.b. works:

	High Duty	Moderate Duty
Fire Clay:		
Pennsylvania	$42.00 to $46.00	$40.00 to $42.00
Maryland	48.00 to 50.00	42.00 to 45.00
Ohio	43.00 to 46.00	40.00 to 43.00
Kentucky	43.00 to 45.00	40.00 to 43.00
Illinois	43.00 to 45.00	40.00 to 43.00
Missouri	45.00 to 48.00	38.00 to 43.00
Ground fire clay, per ton		6.50 to 7.50
Silica Brick:		
Pennsylvania		40.00
Chicago		49.00
Birmingham		54.00
Silica clay, per ton		8.00 to 9.00
Magnesite Brick:		
Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.)		65.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.)		40.00
Chrome Brick:		
Standard size, per net ton		45.00

Bolts and Nuts

Machine bolts, small rolled threads...60 and 10 per cent off list
Machine bolts, all sizes, cut threads
50, 10 and 10 per cent off list
Carriage bolts, smaller and shorter, rolled threads
50, 10 and 10 per cent off list
Carriage bolts, cut threads, all sizes..50 and 10 per cent off list
Eagle carriage bolts.....65 and 10 per cent off list
Lag bolts .....60, 10 and 10 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads....50 and 10 per cent off list
Other style heads .....20 per cent extra
Machine bolts, c.p.c. and t. nuts, ⅝ x 4 in.
45, 10 and 5 per cent off list
Larger and longer sizes.....45, 10 and 5 per cent off list
Hot-pressed nuts, blank or tapped, square.....4c. off list
Hot-pressed nuts, blank or tapped, hexagons....4.40c. off list
C.p.c. and t. square or hex. nuts, blank or tapped.4.10c. off list
Semi-finished hex. nuts:
½ in. and smaller, U. S. S.....80, 10 and 5 per cent off list
⅝ in. and larger, U. S. S.....75, 10 and 5 per cent off list
Small sizes, S. A. E.....80, 10, 10 and 5 per cent off list
S. A. E., ⅝ in. and larger....75, 10, 10 and 5 per cent off list
Stove bolts in packages.....80 and 5 per cent off list
Stove bolts in bulk.....80 and 5 and 2½ per cent off list
Tire bolts .....50, 10 and 5 per cent off list
Bolt ends with hot pressed nuts..50, 10 and10 per cent off list
Bolt ends with cold pressed nuts...45, 10 and 5 per cent off list
Washers .....6c. to 5.50c. off list

The foregoing are delivered prices for 1000 lb. or over, except on stove and tire bolts on which a full freight allowance is made on 300 lb. or over, for shipment within established zone limits, buyers outside of the zone paying the additional freight. Washers and lock washers are quoted f.o.b. Chicago and Pittsburgh.

Semi-Finished Castellated and Slotted Nuts

(Prices delivered within specified territories)
(To jobbers and consumers in large quantities)

	Per 100 Net S. A. E.	Per 100 Net U. S. S.		Per 100 Net S. A. E.	Per 100 Net U. S. S.
½-in.	$0.44	$0.44	⅝-in.	$2.35	$2.40
⅝-in.	.515	.515	¾-in.	3.60	3.60
¾-in.	.62	.66	1 in.	5.55	5.80
⅞-in.	.79	.90	1¼ in.	8.90	8.90
1-in.	1.01	1.05	1½ in.	12.60	13.10
1⅛-in.	1.38	1.42	1⅝ in.	18.35	18.35
1¼-in.	1.70	1.73	1¾ in.	21.00	21.00

Larger sizes—Prices on application.

Cap and Set Screws

(Freight allowed within zone limits)

Milled cap screws....80, 10 and 10 to 80 and 10 per cent off list
Milled standard set screws, case hardened
80, 10 and 10 to 80 and 10 per cent off list
Milled headless set screws, cut thread
80, 10 and 10 to 80 and 10 per cent off list
Upset hex. head cap screws, U. S. S. thread
80, 10, 10 and 10 per cent off list
Upset hex. head cap screws, S. A. E. thread
80, 10, 10 and 10 per cent off list
Milled studs .....75 and 10 to 75 per cent off list

Semi-Finished Steel, f.o.b. Pittsburgh or Youngstown, per gross ton

Rolling billets, Bessemer, 4-in. and over	$37.00 to $38.00
Rolling billets, open-hearth, 4-in. and over	38.00 to 38.50
Forging billets, ordinary carbons	42.50
Sheet bars, Bessemer	38.00 to 39.00
Sheet bars, open-hearth	40.00
Slabs	37.00 to 38.00
*Wire rods, common soft, base, No. 5 to ⅝-in.	48.00
Wire rods, common soft, coarser than ⅝-in.	$2.50 over base
Wire rods, screw stock	$5.00 per ton over base
Wire rods, carbon 0.20 to 0.40	3.00 per ton over base
Wire rods, carbon 0.41 to 0.55	5.00 per ton over base
Wire rods, carbon 0.56 to 0.75	7.50 per ton over base
Wire rods, carbon over 0.75	10.00 per ton over base
Wire rods, acid	15.00 per ton over base
Skelp, grooved, per lb.	2c.
Skelp, sheared, per lb.	2c.
Skelp, universal, per lb.	2c.

*Chicago mill base is $50. Cleveland mill base, $48.

Alloy Steel

(F.o.b. Pittsburgh or mill)

S. A. E. Series Numbers	Bars 100 lb.
2100*(1¼% Nickel, 10 to 20 per cent Carbon)	$3.00 to $3.25
2300 (3½% Nickel)	4.75
2500 (5% Nickel)	6.25 to 6.50
3100 (Nickel Chromium)	3.65
3200 (Nickel Chromium)	5.50
3300 (Nickel Chromium)	7.50 to 7.75
2400 (Nickel Chromium)	6.50 to 6.75
5100 (Chromium Steel)	3.50
5200*(Chromium Steel)	7.50 to 8.00
6100 (Chromium Vanadium bars)	4.25
6100 (Chromium Vanadium spring steel)	4.25
9250 (Silicon Manganese spring steel)	3.50
Carbon Vanadium (0.45 to 0.55 Carbon, 0.15 Vanadium)	4c.
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chromium, 0.15 Vanadium)	4.50
Chromium Molybdenum bars (0.80—1.10 Chromium, 0.25—0.40 Molybdenum)	4.25
Chromium Molybdenum bars (0.50—0.70 Chromium, 0.15—0.25 Molybdenum)	3.75
Chromium Molybdenum spring steel (1—1.25 Chromium, 0.30—0.50 Molybdenum)	4.75 to 5.00

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10-in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4-in. down to and including 2½-in. squares, the price is $5 a gross ton above the 4 x 4 billet price.

*Not S.A.E. specifications, but numbered by manufacturers to conform to S.A.E. system.

PERSONAL

Clinton S. Bradley, recently promoted to the position of general manager of sales, Jones & Laughlin Steel Corporation, Pittsburgh, has been identified with that company about 22 years, and still longer with the iron and steel industry. His first connection was with the Akron Iron Co., Akron, Ohio, which he served in a sales capacity first in Boston and later in Chicago. Leaving that company in 1897 he became affiliated with the Whitman & Barnes Mfg. Co., which he represented in New England as special agent until 1899. For the next four years he was vice-president in charge of sales of the Sterion Copper Co., Chicago, and then went with the Jones & Laughlin corporation in its New York office, becoming reassociated with H. F. Holloway, who was head of the Akron Iron Co. before becoming New York district sales manager of Jones & Laughlin Steel Corporation. Mr. Bradley was made Buffalo district sales manager in 1906 and held that position until October, 1923, when he was transferred to Pittsburgh and made manager of sales in the hot-rolled department, in succession to Robert Geddis. Mr. Bradley is a native of Omaha, Neb., but received his education in the schools of Akron.

CLINTON S. BRADLEY

W. H. Pugh has been appointed representative in Northeastern Pennsylvania for the Roller-Smith Co., with headquarters at its factory in Bethlehem, Pa. He has been representing the company in the immediate vicinity of Bethlehem. Before taking up sales work for the company he was superintendent of works. Prior to becoming associated with Roller-Smith Co. many years ago, he was superintendent of the Columbia Meter Co. at Indianapolis, later taken over by the Roller-Smith Co.

J. E. Stover, who has been connected with the Van Dorn & Dutton Co., Cleveland, in a sales engineering capacity for a number of years, has been promoted to assistant sales manager. He is a graduate of Pennsylvania State University in engineering and has spent most of his time since graduation with the Van Dorn company.

Edward N. Pike, chief engineer of the New England Structural Co., for the past 20 years, has opened an office at 200 Devonshire Street, Boston, where he will engage in engineering work in connection with steel structures, reinforced concrete, design of industrial plants, appraisals and labor saving equipment. He still is retained by the New England Structural Co. as consulting engineer.

William P. Cheney, co-resident manager since 1915 of Rogers, Brown & Co., Pittsburgh, has become associated with the Boston office of Pilling & Co. He became associated with Rogers, Brown & Co. at Boston in 1902, going to Pittsburgh in 1904, and becoming manager of the coke department in 1906.

Robert M. Catlin, Eastern manager of mines, New Jersey Zinc Co., was elected president of the Mining and Metallurgical Society of America at its recent meeting in New York.

William H. Lucas, Jr., for the past 21 years chief engineer and factory superintendent of the Espen-Lucas Machine Works, Philadelphia, builder of automobile production and special machinery, has been appointed factory and production manager for the Delling Motors Co., at West Collingswood, N. J.

O. L. Chapman has joined the sales organization of the Scott Valve Mfg. Co., Detroit.

J. B. Thorpe has resigned as general superintendent of the alloy division, United Alloy Steel Corporation, Canton, Ohio. He went to Canton in 1918 from Gary, Ind., where he was connected with the United States Steel Corporation. Mr. Thorpe has had a wide experience in the steel industry. He graduated in 1903 from the University of North Carolina and has been actively engaged in the industry since that time. No announcement has been made as to his future plans.

Judge Elbert H. Gary, chairman United States Steel Corporation, expects to pay a visit to Pittsburgh, Thursday, Jan. 29, in connection with plans of the University of Pittsburgh for forwarding its building program. He will be a guest of honor of the trustees at dinner, to be given at the William Penn Hotel. Recently the university announced its intention to house its entire activities in a 52-story building, to be called the Cathedral of Learning.

A. A. Fowler, resident manager in New York of Rogers, Brown & Co., sailed last Saturday on a business trip to Europe.

W. H. Dickson, of the Alan Wood Iron & Steel Co., Philadelphia, who has for some time been in charge of sales of the company in the Philadelphia district, has been appointed to the newly created position of Philadelphia district sales manager. Traveling in the Philadelphia district will be LeRoy Richards, formerly of the company's Los Angeles district office, and H. H. Neel, formerly of the Bethlehem Steel Co. and later with the Reading Iron Co., Reading, Pa.

F. C. Milliken, of the Philadelphia office of the Alan Wood Iron & Steel Co., has been appointed manager of sales in the billet department, a newly created position.

George E. Doke, engineer of materials and equipment tests of the New York Central Railroad at New York, has resigned effective Feb. 1, and has been elected president of the Association of Manufacturers of Chilled Car Wheels, with headquarters at Chicago, to succeed the late George W. Lyndon, who died on Oct. 7. Mr. Doke was born in Tecumseh, Mich., in 1877, and was educated in the schools of Elkhart, Ind. He entered the shops of the Lake Shore & Michigan Southern Railroad as an apprentice and, while serving in this position, completed a special course in mechanical engineering. In 1905 he entered the chemical laboratory of the Lake Shore railroad at Cleveland as an assistant, becoming chief material inspector in 1906. Six years later he was promoted to assistant engineer of tests in charge of the locomotive and car department's service tests and in 1916, following the consolidation of the Lake Shore with the New York Central lines, was made assistant engineer of tests in charge of material inspection for the car and locomotive departments of the combined systems. Four years later he became engineer of materials with headquarters at Cleveland, in charge of inspection and the development of material specifications. Soon after he was made engineer of tests of the New York Central Railroad in New York, in charge of chemical and physical laboratories, material inspection bureau, service test department and dynamometer car tests.

GEORGE E. DOKE

John G. Stephenson, for the past five years connected with the Standard Tank Car Co., Sharon, Pa., in the accounting and purchasing departments, has resigned to become assistant purchasing agent of the Standard Slag Co., Youngstown.

O. C. Martin will sail Feb. 7 for Europe, where he will take up duties as consulting metallurgist with the Societé Générale Metallurgique de Hoboken and the Union Miniére du Haut Katanga, with offices in Brussels and Antwerp. He will superintend the construction and operation of a refinery which these companies intend to build at Oolen, Belgium. Mr. Martin's recent position was plant manager of the Maurer plant of the American Smelting & Refining Co. at Perth Amboy, N. J. Before that he was manager of the Nichols Copper Co.'s plant located at Laurel Hill, L. I. The Belgian capitalists interested in the new enterprise control large deposits of ore in the Belgian Congo.

Robert S. Lyons has resigned from the National Tube Co. after 15 years of service with the organization and is now associated with Clayton Mark & Co., manufacturers of pipe and well supplies, Chicago.

W. K. Palmer, Sterling, Ill., has purchased the interest of E. J. Consoer, president and general manager Peerless Tool & Level Co., that city.

J. P. Fleming has been appointed secretary of A. L. Seaman & Co., steel mill representatives, Chicago, effective Jan. 2.

W. L. Hayes, who has been manager of the wire mills of the American Steel & Wire Co. in the Chicago district, has been appointed manager of the company's wire mills in the Cleveland district. He has been succeeded in Chicago by Fred Ingraham, who has been superintendent of the Cuyahoga Works in Cleveland. J. T. Leach, who has been Mr. Ingraham's assistant for several years, has succeeded him as superintendent of the Cuyahoga Works. Mr. Hayes was formerly assistant manager of the Cleveland district wire mills and in 1916 was promoted to the position he has since held in Chicago. Mr. Ingraham has been superintendent of the Cuyahoga Works in Cleveland for four years. He became superintendent in 1908 and since has held that position at various plants of the company.

Lester R. Hawkins, who has been Pacific Coast representative of the Warner & Swasey Co. for five years, has been appointed general European sales representative. He will sail for Europe on the Olympic, Jan. 24. Headquarters will be made in London and Paris.

OBITUARY

DANIEL G. REID, prominently identified with the early history of the tin plate industry in the United States, an organizer of the consolidation of the sheet and tin plate companies in 1898 and 1899, and a director of the United States Steel Corporation from 1901 until 1918, died of pneumonia on Jan. 14 at his home, 907 Fifth Avenue, New York. Born at Richmond, Ind., in 1858, he became vice-president of the Second National Bank there, and in 1892 purchased a small tin plate mill at Elwood, Ind. Associated with him in this venture were Judge William H. Moore and W. B. Leeds. Their success was marked. When all the tin plate companies in the country were merged in the American Tin Plate Co., Mr. Reid became president. In 1901, when the Steel Corporation was organized, Mr. Reid was made a director and a member of the executive committee. He had been an important factor in the National Steel Co., the American Sheet Steel Co., and the American Steel Hoop Co., all of which entered the Steel Corporation. During the suit to dissolve the Steel Corporation in 1912, Mr. Reid testified that the tin plate company then produced 53 per cent of the country's output. He was one of the founders of the American Can Co. and was chairman for a number of years. With Messrs. Moore and Leeds he acquired control of the Chicago, Rock Island & Pacific Railway Co. and in 1910 some of the fluctuations in its stock attracted attention widely. Mr. Reid had been in ill health for several years.

RALPH C. RICHARDS, one of the organizers and fifth president of the National Safety Council, died at his home in Geneva, Ill., Jan. 3, after a long illness. Mr. Richards was 69 years old and on July 1, 1924, had retired as claim agent of the Chicago & Northwestern Railroad, with which he had been associated 54 years. In 1910 Mr. Richards established organized safety work on the North Western and in the first year 792 employees of the railroad were appointed safety committeemen meeting with the management to discuss remedies for accidents. This resulted in a notable reduction of injuries both to employees and passengers. Mr. Richards attended the first cooperative safety conference in Milwaukee in 1912 and was elected a member of the committee of 25, charged with the responsibility of considering the second safety congress and the organization of the National Safety Council. He was also one of five who drafted the constitution and by-laws of the organization. One of the first members of the national executive committee, he was later the first chairman of the steam railroad section and occupied virtually every important office in the National Safety Council, including the presidency in 1919-1920. Mr. Richards also enjoyed the distinction of being one of only three distinguished national industrialists who have been elected honorary members of the council since 1913. The other two are Judge Elbert H. Gary and Robert W. Campbell.

MERRILL W. WILCOX, secretary and assistant general manager of The Wilcox Motor Parts & Mfg. Co., Saginaw, Mich., died at his home in that city, Jan. 7, at the age of 37, after an extended illness of typhoid fever.

L. B. DESHETLER, assistant purchasing agent Ryan Car Co., Chicago, died Jan. 13.

GLENN GRENVILLE HOWE, for many years senior vice-president of the Link-Belt Co., died at his home in Muskegon, Mich., on Dec. 25, after a long illness. He went with the company at the age of 16 as an office boy, later entering the manufacturing department, and becoming superintendent of the Ewart Mfg. Co. Upon the merger of this company with the two related interests into the Link-Belt Co. in 1906, Mr. Howe became vice-president in charge of the operations at Indianapolis.

CLYDE E. MAXWELL, aged 47, superintendent of the plate mill department at the Brier Hill Works of the Youngstown Sheet & Tube Co., dropped dead Jan. 20, following an attack of heart trouble. For many years he was an operating official.

OLIVER P. BALLIET, aged 63, formerly chief engineer of the Allentown, Pa., plant of the American Steel & Wire Co., died at his home in Forrest, Ohio, Jan. 10, following a short illness. At the time of his death he was general manager of the Hardin Electric Power Co., Forrest.

GEORGE A. GUTLIPH, for the past 15 years chief engineer of the Crouse-Hinds Co., Syracuse, N. Y., died at his home near that city, Jan. 14, following a short illness of pneumonia. He was 57 years of age.

GEORGE LOUIS LAVERY, a graduate of the Massachusetts Institute of Technology, died suddenly last week at the home of his daughter in Elkins Park, Pa. He was born in Boston in 1856. In 1885 Mr. Lavery went to Chicago as manager of the office of the Yale & Towne Mfg. Co. Later he organized the American Post Office Equipment Co., of which he was president until disposing of his interest. In 1915 he became associated with the West Steel Castings Co., Cleveland, and in 1922 became general manager of the Tire and Rim Association of America. This position he held at the time of his death.

WILLIAM D. HOXIE, vice-chairman, Babcock & Wilcox Co., boiler manufacturers, died on Jan. 12 on the steamship Southern Cross, en route to South America with his family.

DECEMBER STRUCTURAL SALES

Country's Capacity Now Put at 3,480,000 Tons Per Annum

WASHINGTON, Jan. 20.—Sales of fabricated structural steel for December, 1924, were made at the rate of 80 per cent of capacity, based on total bookings of 195,887 tons reported by 175 fabricators with a capacity of 243,975 tons per month, according to the Bureau of Census. This compares with sales of 206,957 tons or 83 per cent of a capacity of 250,830 tons reported by 187 firms in November.

Shipments of fabricated steel in December amounted to 182,700 tons, representing 63 per cent of capacity as against 185,600 tons, or 64 per cent of capacity in November.

Computed bookings in December were 232,000 tons compared with 240,700 tons in November.

Total bookings for 1924 by 192 identical reporting firms, including reports from additional firms now out of business, with allowances for a few missing firms in December, amounted to 68 per cent of capacity as against 65 per cent in 1923 by the same firms. The capacity of fabricators during 1924 is estimated at 290,000 tons per month as against 285,000 tons in 1923, based on actual reports by 218 firms with a capacity of 261,690 tons in 1924, and estimated capacities for other firms.

December was the second best month of the year, being slightly under November, and the indicated tonnage of 1924 was 2,350,000 tons, or over 15 per cent more than the 2,030,000 tons of 1923.

Week's Awards Exceed 51,000 Tons with Fresh Inquiries for 29,000 Tons

Swelled by the award of some 26,000 tons for the New York Life Insurance Co. building to be erected on the site of the historic Madison Square Garden, New York, the week's bookings mounted to 51,000 tons, and brought the weekly average so far in January, in the case of sizable projects, to the average of November and December. Steel plant construction, including a revival of the Ford Motor Co. works, put fresh inquiries at 29,000 tons. Awards include:

New York Life Insurance Co., New York, office building on site of Madison Square Garden, 26,000 tons, to American Bridge Co.

Albana Realty Co., New York, building at 248 West Thirty-Fifth Street, 1200 tons, to Harris Structural Steel Co.

Starco Realty Co., Long Island City, warehouse, 900 tons, to Levering & Garrigues Co.

New York Edison Co., substation on West Thirty-Sixth Street, New York, 500 tons, to Levering & Garrigues Co.

Pennsylvania Railroad, bridge at East St. Louis, 400 tons, to McClintic-Marshall Co.

Toledo Edison Co., Toledo, Ohio, building, 800 tons, to American Bridge Co.

Holly Sugar Co., Sydney, Mont., beet sugar plant, 700 tons, to Minneapolis Steel & Machinery Co.

Public school No. 105, Brooklyn, N. Y., 1200 tons, to Hedden Iron Construction Co.

Delaware, Lackawanna & Western Railroad, bridge, 500 tons, to an unnamed fabricator.

Portland Cement Co., Portland Point, N. Y., pack and bag house, 250 tons, to R. S. McManus Steel Construction Co.

Detroit Edison Co., gas holder, 900 tons, to Stacey Mfg. Co.

Detroit, office and theater building, 3000 tons, to Whitehead & Kales Iron Works Co.

Stone Bakery Co., Atlanta, Ga., plant, 300 tons, to Virginia Bridge & Iron Co.

Central Tube Co., Economy, Pa., furnace buildings, 150 tons, to Jones & Laughlin Steel Corporation.

Kelly Stone Co., lake vessel, 3000 tons, to Manitowoc, Wis., Shipbuilding Co.

Jackson shore apartment house, Chicago, 2500 tons, to American Bridge Co.

Rock Island Lines, bridge work, 1500 tons, to American Bridge Co.

Corn Products Refining Co., Pekin, Ill., plant building, 206 tons, to Vierling Steel Works.

Bucyrus Co., South Milwaukee, shipping building and carpenter shop at Evansville, Ind., 124 tons, to International Steel & Iron Co.

Kinnickinnic River bridge at River Falls, Wis., 120 tons, to Minneapolis Bridge Co.

Oaks Theater, Berkeley, Cal., 100 tons, to Central Iron Works.

Apartment house, California and Mason Streets, San Francisco, 2200 tons, to Dyer Brothers.

California-Oregon Power Co., structural supports for pipe line, 110 tons, and 50 tons of plates, to Pacific Coast Engineering Co.

Cushman Power project, Tacoma, Wash., substation, 225 tons, to Star Iron Works.

Sun Finance Co., store and office building, Fifth Street and Broadway, Los Angeles, 600 tons, to Llewellyn Iron Works.

Knights of Columbus building, Canton, Ohio, 200 tons, to Canton Bridge Works.

Union Pacific System, 350-ton coaling station, 150 tons, to McClintic-Marshall Co.

Burnham Boiler Corporation, Lancaster, Pa., plant, 140 tons, to McClintic-Marshall Co.

American Furniture Mart, Chicago, addition, 3000 tons, to Duffin Iron Works.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

Apartment house 912-14 Fifth Avenue, New York, 600 tons.

Apartment house, 12 stories, Lexington Avenue and Forty-Eighth Street, New York, round tonnage, formal inquiry not yet issued.

Loft building, 236-42 West Twenty-sixth Street, New York, 900 tons, Shampan & Shampan, Brooklyn, N. Y., architect.

Storage warehouse, Webster Avenue and 180th Street, New York, 600 tons.

New York Telephone Co., New York, building in Astoria, L. I., 200 tons.

Public Service Production Co., Newark, N. J., extension to switch house, 300 tons.

New York Edison Co., building on West Sixty-Fourth Street, New York, 200 tons, bids in.

Nelson House, Poughkeepsie, N. Y., addition, 200 tons.

U. S. Engineers, Pittsburgh office, three steel barges, 425 tons, American Bridge Co. low bidder.

Miami-Biltmore Hotel Co., New York, hotel at Miami, Fla., 1200 tons.

Miami, theater and office building, 1100 tons.

University of Maine, Orono, Me., gymnasium building, 600 tons, bids in.

Pennsylvania Railroad, bridge at York, Pa., 300 tons.

Apartment house, Providence, R. I., 1000 tons.

Ford Motor Co., open-hearth plant, 12,000 tons, bids taken.

McKinney Steel Co., Cleveland, mill buildings, 3000 to 4000 tons.

Chicago, hotel and theater, Fifty-third and Cornell Streets, 3000 tons.

Mark Twain Hotel, Kansas City, Mo., 1200 tons.

Eli Lilly Co., Indianapolis, warehouse, 250 tons.

Tayco Street bridge at Menasha, Wis., tonnage undetermined, estimated cost $150,000, McMahon & Clark, engineers, bids about April 1.

Atkins theater, Berkeley, Cal., 105 tons, Herrick Iron Works, low bidder.

Pacific Telephone & Telegraph Co., Fresno, Cal., building, 200 tons.

City of San Diego, Cal., bridge over San Diego River at Old Town, 256 tons.

Pacific Gas & Electric Co., San Francisco, three gas generators, 480 tons of plates.

Flushing Bridge, Arthur McMullen Co., New York, low bidder.

Central Police Station, Cleveland, 500 tons.

Homeopathic Hospital, New York, addition, 250 tons.

Youngstown Scrap Market

YOUNGSTOWN, Jan. 20.—In this district scrap metal has softened somewhat the past week, and heavy melting is now priced at a range from $21.50 to $22. Deliveries have been made to melters in this and nearby districts the past two weeks at an average price of $21.75 for this grade. Machine shop turnings are priced at $17.50 and compressed sheet steel at $20.50.

The Trumbull Steel Co. at Warren is understood to have closed on a round lot of heavy melting last week. The Republic Iron & Steel Co. is an occasional buyer. Both the Youngstown Sheet & Tube Co. and the Sharon Steel Hoop Co. are out of the market at present.

Some dealers are inclined to feel that published quotations lately have averaged 50c. per ton too high.

Steel Treaters Hold Sixth Sectional Meeting

(*Continued from page 274*)

the added time required is offset by the saving in fuel, furnaces, containers, carburizing compounds and the longer life of the finished article. For the best results after carburizing, double quenching is desirable, the first at a temperature sufficiently high to refine the core and the second at a lower temperature to refine the case. The relative merits of case-hardened and oil-hardened gears is receiving a large amount of attention by gear users. Oil-hardened gears, as a general rule, can be counted on for steady, uniform wear.

Alloy Steel Gears

The speaker referred to the leading role played by ferroalloys. The latent qualities of a steel are susceptible of immense improvement by correct heat treatment and these latent qualities are vastly increased by correct incorporation of alloys with steel. For general conditions, gears made of straight chrome-nickel steel when properly treated give splendid results. In annealing gear blanks of this alloy, his company attempts to bring the structure to the sphereodized cementitic state. This is done in a 30-ft. continuous furnace in three stages: First, heat thoroughly to 1550 deg. Fahr., and then cool rapidly to about 1200 deg. Then reheat to 1300 deg., and finish cooling in air away from all drafts and moisture. This leaves the blanks at Brinnell hardness of 196 to 207, without the presence of free ferrite in masses. This alloy possesses wide range of temperatures for heat treatment, and is not subject to excessive warpage. After the final draw this alloy has hardness sufficient to withstand heavy tooth pressures without pitting. In hardening this material it is preferable to use a salt bath and sometimes lead. The speaker concluded by referring to the proper lubrication of gears as just as important a problem as any other phase of industrial plant lubrication.

Discussion brought out the unreliability of the file test on oil-hardened gears. It was also stated that there is a fundamental change in the making of gear blanks with foundrymen rapidly doing away with the old hit-and-miss methods and turning to scientific ones. The practice of quenching straight carbon steels in water and then oil hardening is becoming universal. To a question as to whether distortion of gears can be controlled by the use of a quenching machine, the general reply was that this can be done.

High-Power Photomicrography

At the afternoon session, of which Prof. H. M. Boylston, Case School of Applied Science, Cleveland, was chairman, R. G. Guthrie, metallurgist industrial gas department, Peoples Gas Light & Coke Co., Chicago, read a paper on "Sample Preparation for High-Power Photomicrography," in which he emphasized the importance of proper equipment, proper preparation of the sample and absolute cleanliness throughout the entire procedure. His paper was supplemented by the showing of a series of photographs in duplicate, giving the results obtained in the same field under plain axial and conical illumination.

Wear and Wear Testing

G. W. Quick and S. J. Rosenberg, Bureau of Standards, Washington, in a paper read by Mr. Quick, on "Wear and Wear Testing," described preliminary tests that have been made of two methods of wear testing. In one use was made of the Amsler wear and friction testing machine. In the other, test specimens were tumbled in a ball mill with an abrasive material. The results of both tests indicated that tempering hardened steel at a low temperature increases the resistance to wear by abrasion. Under the condition of tests, hardened steel had a very superior resistance to wear by abrasion compared with stellite, manganese steel and chilled iron. The authors of the paper attempted to draw no definite conclusions regarding wear of different steels but stated that the data obtained to date emphasized the desirability of further work in this connection.

"Corrosion Resisting Steels of the Iron-Carbon-Chromium and the Iron-Carbon-Chromium-Silicon Series," was discussed by T. Holland Nelson, consulting metallurgist United Alloy Steel Corporation, Canton, Ohio. Mr. Nelson referred briefly to the experiments conducted in 1912 which resulted in the discovery of stainless steels. Iron-carbon-chromium steel first made its appearance through the cutlery industry. He said that iron-carbon-chromium alloys with chromium content under 16 per cent—invariably between 12 and 14 per cent—in the unhardened state consist of a ground mass of iron alloyed with chromium which exists as carbides. This material, heat-treated in such a manner as to cause complete diffusion of the free carbides, is in its most suitable condition to resist corrosive attack.

Iron-carbon-chromium-silicon alloys contain over 16 per cent chromium, usually 16 to 18.5 per cent, and from 9.50 to 1.50 per cent silicon. This material, containing higher chromium content with the addition of silicon, does not harden. Therefore diffusion of the carbides by heat treatment would not seem to be possible. This material is, however, resistant to corrosion in a marked degree in all conditions, and it would seem that either the introduction of silicon or the higher chromium content has in some manner prevented the formation of the usual carbides and the galvanic action which results in the lower chromium steels without silicon.

After describing the manufacture, melting practice, forging and rolling of stainless steels, the author stated that for hardening the iron-carbon-chromium series of steels a temperature of 1700 deg. Fahr. is desirable. This will vary somewhat according to cross sectional area and the shape of the object to be hardened. Air hardening of thin and intricate shapes is found advantageous, whereas simple and heavier sections can be either oil or water-quenched. It should be remembered that the diffusion of the carbides in high-chromium steels takes longer than in straight carbon steels and ample time should be allowed for this change to take place before quenching. Ductility of the material is scarcely affected by tempering below 900 to 925 deg. Fahr., and from this temperature upward ductility is obtained somewhat at the expense of corrosive resistance, though it should be clearly understood that hardened and fully tempered iron-carbon-chromium steels are still highly resistant to rust and corrosion.

High Tensile Strength and Low-Carbon Steel

At the evening session R. H. Smith, vice-president Lamson & Sessions Co., Kent, Ohio, described results from quick quenching of materials in his plant. This paper was delivered in part at the last meeting of the American Society for Testing Materials in June, 1924. The author pointed out that while steel containing not over 0.15 per cent carbon responded but feebly to the usual method of quenching, it stages a rather remarkable performance when the conditions of this quench are accurately controlled. While the tests made and data collected are not complete enough from which to draw broad conclusions, nevertheless they point to the probability that, roughly speaking, the strength of low-carbon steel, 0.15 and under, when rapidly quenched from points above 900 deg. Fahr., varies directly with the temperature. The continuity of the increase in strength is accelerated at the upper and lower critical temperatures.

For the tests standard specimens were used. The device for cooling the test pieces was described as a quenching jig with a bushing, with openings running the length of the reduced portion of the specimen, through which huge volumes of water are forced through a 2½-in. supply pipe. The time of heating varied from 4 min. at 2300 deg. Fahr. to 25 min. at the lowest temperature range, and an effort was made to quench just as soon as the required temperature was reached. Specimens generally were normalized. No connection between the normalizing and subsequent response to heat treatment could be traced except at the lower temperature.

One of the noteworthy results of the tests was the shape of the reduction of area curve, also the increase in tensile strength below the lower critical. The elongation in 2-in. curve was roughly comparable to the reduc-

tion of area. The very marked drop in reduction of area around 1310 deg. is apparently well established by the tests.

It was shown from the tests that the strength per square inch went up in practically a straight line at the lower temperatures until about 1300 deg., at which point it rose abruptly, with another marked rise around 1600 deg. With the method it was difficult to get ordinary specimens to show uniformly and consistently above 122,000 lb. per sq. in. at the higher temperature. With five specimens treated and attached to a 3-ft. bar, thus lending themselves to quick handling in the withdrawal from the furnace, the strength ran as high as 148,000 lb. per sq. in.

Summarizing, the author stated that the experiments were made with the object of tabulating and describing the reactions of low carbon steel (0.15 per cent and under) to extremely quick quenching from temperatures ranging from 860 to 2400 deg. Fahr.

The results showed that the tensile strength per square inch is increased continuously from about 48,000 lb. per sq. in. at the lowest temperature to about 150,000 lb. at the highest. The reduction of area decreased suddenly at the lower critical temperature.

The author concluded from the tests that it was impossible to secure tensile strengths in commercial or tonnage production in this low-carbon steel higher than 90,000 lb. per sq. in. without objectionable brittleness. A wide choice in relation between the tensile strength and the reduction of area is possible by properly coordinating the heat-treating and drawing temperatures. For example, it is possible to make a rivet or bolt with a tensile strength of 100,000 lb. per sq. in. with a reduction of area of more than 50 per cent. Similarly a tensile strength of 70,000 lb. per sq. in. with a reduction of area of more than 70 per cent is practicable.

The Dinner and Plant Visitation

At the informal dinner at the Hotel Sinton Thursday evening Julian A. Pollak, vice-president Pollak Steel Co., Cincinnati, presided as toastmaster. An address of welcome to the delegates was made by Fred A. Geier, president Cincinnati Milling Machine Co., and this was responded to by President W. S. Bidle of the national society. Other speakers included E. F. DuBrul, general manager of the National Machine Tool Builders' Association, and Secretary W. H. Eisenman.

Friday was given over to plant inspection. In the morning the delegates were driven to the plants of the Cincinnati Bickford Tool Co., and the Cincinnati Milling Machine Co., where luncheon was served. Part of the delegations in the afternoon visited the plants of the Ahrens-Fox Fire Engine Co., the Procter & Gamble Co., and the American Rolling Mill Co. In the evening the visitors were entertained at dinner at the Claremont by officials of the Andrews Steel Co. and the Newport Rolling Mill Co., followed by a visit of inspection to the two plants.

INTEREST IN FOREIGN RAILS

American Railroads Reported Negotiating for Purchase—Chinese Market Improved—Japan Quiet

NEW YORK, Jan. 20.—Export to the Far East continues dull, partly attributable to the higher quotations now being made by American mills and partly to the increased activity of German sellers, as well as French, Belgian and British mills. Recent purchases of structural material by Japanese consumers are reported to have been placed with German mills at $8 to $9 per ton less than the American price and the material furnished was of open-hearth quality in several instances. A fair volume of black sheet business is said to have gone to British makers recently, while several thousand tons of light gage black sheets have been placed in the United States for shipment to arrive in Japan before March 10.

Recent shipments of black sheets and tin plate have been insured by the exporter at rates varying from 1 per cent to 7 per cent for delivery before the higher duties go into effect after March 10. Most of the sheets purchased for Japanese shipment were placed at the recently prevailing quotations of $96 to $98 per ton, c.i.f. port, while the current price is about $101 per ton, c.i.f. Competition from Germany has been felt in gas pipe, the inquiry of the Imperial Government Railways for 1,130,000 ft. going to a German maker at a price corresponding to a discount of 73 per cent off list, c.i.f. Japan. The American quotations are understood to have ranged from 66 to 69 per cent off list.

Another fairly large order that did not go to American mills was the 15 miles of 75-lb. rails for which the Keisei Denke Kaisha inquired in December. Award was made to the Imperial Government Steel Works by a Japanese export house. Business taken by American makers lately has included manufactured specialties, such as the appliances and smaller parts of railroad cars, particularly passenger and Pullman. The Nagoya Electric Railway awarded 1000 pairs of splice bars to a Japanese export house for shipment from the United States, and the Kawasaki Dockyards Co. has purchased about 100 tons of heavy channels in the United States.

The Chinese market is showing a gradual improvement despite the approach of the Chinese New Year, usually the signal for a period of quiet of several weeks duration. Wire shorts have been in better demand lately and this knowledge has caused some speculation. Prices have ranged from $35 to $45 per ton, f.a.s. port, with the average purchase price on standard assortments about $40 per ton, f.a.s. Second-hand material is in greater demand and exporters to Chinese markets are offering slightly better prices for second-hand plates, plate cuttings, bar crop ends and similar material, than for some time. While there is a small volume of inquiry for new material, purchases are confined to small lots.

Continental Competition

Competition of Continental Steel in the United States seems to be developing along a line somewhat unusual. Rails, which have been difficult to sell to American consumers, are taking a somewhat prominent place in negotiations of importers with American consumers. Since the Ford purchase in December, there are reports of negetiations with various smaller consumers of rails in the United States. The Cowlitz, Chehalis & Cascade Railway, Chehalis, Wash., is one of the smaller railroads reported to have recently purchased European rails, about 2000 tons being named as the tonnage awarded. The Interborough Rapid Transit Co., New York, is reported to be negotiating for about 5000 tons of rails with European interests.

In connection with these rail purchases it is noteworthy that German makers are prepared to quote on open-hearth steel rails, made to American specifications, and importers claim to be able to quote these open-hearth sections at $30 to $32 per ton, c.i.f. Atlantic or Pacific port. One importer points out that German rails could be delivered into Texas at about $38 per ton, on the ground specified by the purchaser, compared with about $48 per ton for American rails, based on $43, f.o.b. mill, plus the usual freight rate from Birmingham, the nearest point.

Record Production of Portland Cement

Preliminary figures for United States production of portland cement show a total in 1924 of 148,859,000 bbl., compared with 137,460,000 produced in 1923—the previous high record. The advance is about 8 per cent. Every month throughout the year showed a gain upon the corresponding month of the previous year.

Shipments are given as 145,747,000 bbl. in 1924, compared with 135,912,000 bbl. in 1923. During the year several new monthly records in shipments were made, culminating in the 17,160,000 bbl. in October. This was the fifth successive month showing more than 15,000,000 bbl., a figure which never had been reached in any month of any previous year.

Plans of New Companies

J. F. McLaughlin Co., Inc., 738 Broad Street, Newark, N. J., recently was incorporated with 1000 shares of stock, no par value, and plans to conduct a general engineering business, as well as to sell and install refrigerating machinery and forged draft blowers. Mr. McLaughlin heads the company.

The Printers Equipment Mfg. Co., 1151-61 North Third Street, Philadelphia, has been incorporated with $25,000 capital stock, $10,000 of which is paid in, to continue a business in the manufacture of printers' chases and printers' make-up trucks. Solomon L. Fridenberg is secretary.

The Smelting & Refining Co., 11-13 Bates Street, Jersey City, N. J., has been organized with $50,000 capital stock to operate a refining plant. It occupies a two-story building with modern improvement and plans in the near future to install and operate a refining and smelting equipment. The company is in the market for various kinds of metals. No contracts have been let.

The General Die-Casting Co., Reading, Pa., recently organized, has purchased a plot of land, upon which it plans to construct a plant whose ultimate floor capacity will be about 200,000 sq. ft. Production will consist of die cast parts. Construction has been started on one fire-proof steel unit which will be equipped with modern automatic and labor saving machinery. Progress indicates that it will be ready about March 1. F. C. Morrison, who for the past 12 years has been manager of the die casting division of the Light Mfg. & Foundry Co., Pottstown, Pa., will have supervision of the plant as vice-president and general manager.

The Nassau-Suffolk Steel Co., Inc., 33 South Grove Street, Freeport, N. Y., has been organized to operate as distributor of a general line of steel products including structural steel, concrete reinforced cars, steel sash, etc. F. S. Carr is president and W. J. Martin, treasurer.

The Great Lakes Sheet Metal Works has been incorporated with 30,000 shares of stock, no par value, and $150,000 in 7 per cent cumulative preferred. It plans to sell $140,000 in preferred stock, after which a plant will be built and equipped to turn out sheet metal products. Operations are now being conducted at 2338 Russell Street, Detroit. The chief product of the new plant will be ventilators. Present address is in care of Robert Davidson, Suite 1824, Dime Bank Building.

The Standard Spring Cover Co., with temporary address at 170 Elm Street, New Rochelle, N. Y., has been organized as the American subsidiary of an Italian concern manufacturing metallic spring covers with oil bath. The company is looking for a convenient location to establish operations in this country. W. D. Baruch is representative.

The Button Attaching Machine Co., Waterbury, Conn., recently organized with $60,000 capital stock, will engage in manufacturing a newly patented button attaching machine for the garment trade. L. J. Hart is treasurer.

The Stafford Roller Bearing Car Truck Corporation, has been incorporated with $300,000 capital stock as a reorganization of The Roller Bearing Corporation, which was purchased about four months ago by J. F. Stearn. Operations will be continued in the plant at Lawton, Mich. The company will be in the market for materials for bearings, consisting largely of chrome steel.

The Price-Rochester Corporation, Rochester, N. Y., has been organized to succeed the Potential Regulator Co., originally formed to market a generator for battery charging with a voltage regulator. The motor generator sets are manufactured for the company by the Rochester Electric Products Corporation. E. F. Davison is one of the principals.

The Poney-Bike Mfg. Corporation, 11 Duffield Street, Brooklyn, has been incorporated with $500,000 capital stock and is completing the installation of equipment for manufacturing mechanical toys. It will use the plant, 25 x 130 ft., two stories, formerly occupied by the New York Chemical Co. Its potential capacity is practically unlimited. Marcus G. Goldstein, formerly owner of the Chemical Co., is president of the new corporation; Lester Goldstein, vice-president; Sidney Goldstein, treasurer; Louis Summers, comptroller, and J. K. Selenkow, secretary. It is planned to start operations about Feb. 1.

Charles Freshman, Inc., 240 West Fortieth Street, New York, incorporated with 225,000 shares of stock, no par value, will engage in manufacturing radio equipment, having immediate capacity for about 30,000 receivers a month. No expansion is planned at the present, but this may be necessary later. Mr. Freshman is president; Myron Goldsoll, vice-president, and A. W. Franklin, treasurer.

The Manhattan Enamel Ware Co., New York, recently incorporated with $150,000 capital stock, will take over the business of an established manufacturer in this line. Present address is in care of Isaac Marks, 358 Fifth Avenue.

The Standard Forgings Co., Chicago, has organized a subsidiary company known as the St. Louis Forgings Co., which has acquired the forging plant at East St. Louis, Ill., formerly owned and operated by the Laclede Steel Co., St. Louis. Operations will be continued in the production of car and locomotive axles and forgings, and an office has been established in St. Louis.

W. C. Lipe, Inc., 208 South Geddes Street, Syracuse, N. Y., has been incorporated to take over the business of W. C. Lipe, designer and manufacturer of special machinery, tools, gears, etc.

W. P. Leshure, whose connection with the grinding wheel business covers over 40 years, has begun the manufacture of grinding wheels under the name of the Leshure Co., 55 Governor Street, Springfield, Mass., specializing in wheels made by the bakelite, elastic, rubber and silicate processes, of both silicon carbide and aluminous oxide abrasives. Mr. Leshure was one time president of the Hampden Grinding Wheel Co.

The International Feldspar Corporation of Ogdensburg, N. Y., has been organized for the purpose of grinding and otherwise preparing Canadian feldspar for the ceramic industry in the United States. The company has purchased from the Buckingham Feldspars, Ltd., what is described as the largest dyke of high-grade feldspar thus far discovered in that district. The International company's plans for building a plant in Ogdensburg are now maturing. No contracts have as yet been awarded, or materials purchased, and submissions will be carefully considered.

Louis E. Zurbach, long associated with Wetherell Brothers Co., Cambridge, Mass., announces the incorporation of the L. E. Zurbach Steel Co., with office and warehouse at 145 Oliver Street, Boston. The company will handle cold rolled strip steel made by the Wallingford Steel Co., Wallingford, Conn., black and full finished sheets made by the Canonsburg Steel & Iron Works, Canonsburg, Pa., high-carbon and alloy sheets, bars and special shapes.

The Service Tool Co., Latrobe, Pa., recently incorporated, will manufacture milled files in a fully equipped plant which the company has under lease at Latrobe. A permanent organization has not yet been effected but for the purpose of incorporation, W. S. Jones is president; F. P. Underwood, secretary, and E. L. Moberg, treasurer. Mr. Moberg is vice-president of the Vanadium-Alloys Steel Co., Latrobe.

W. R. Pender has opened engineering offices in the Electric Building, Houston, Tex., where he will specialize in power plant engineering and maintenance of industrial plants.

F. Gripe, for the past ten years purchasing agent of the E-Zest Way Stove Works, subsidiary of Sears, Roebuck & Co., Chicago, has resigned, effective Jan. 1, to enter the selling field and will operate under the firm name of National Mill Products Co., with headquarters at Chicago.

Industrial Notes

Machinery equipment and supplies of the Premier Mfg. Co., Sandy Hook, Conn., will be sold at public auction on Jan. 14. Sale starts at 11 a. m. on the premises and is conducted by the Industrial Plants Corporation, 25 Church Street, New York.

The Bryant Mfg. Co., 1475 Broadway, New York, manufacturer of zinc products, has tendered an offer of $45,000 for the plant of the McNab & Harlin Mfg. Co., Straight Street, Paterson, N. J., it is understood. The Federal Court has issued an order to show cause why the offer should not be accepted. The bankrupt, McNab & Harlin Co., manufactures pipe, plumbing supplies, etc. Samuel D. Leidesdorf and William H. Kearns are the receivers.

Orders received by the General Electric Co. for the three months ended Dec. 31 totaled $50,009,978, an increase of 7 per cent over the same quarter in 1923, according to figures submitted by Owen D. Young, chairman of directors.

Orders during 1924 totaled $283,107,697, as compared with $304,199,746 for 1923.

The Purox Co., Denver, manufacturer of welding and cutting apparatus and supplies, soon will complete two acetylene plants, one at Los Angeles, Cal., the other at Oakland, Cal.

H. D. Kopf has been appointed receiver of the Commercial Drop Forge Co., Warren, Pa.

Machinery Markets and News of the Works

EXPORT ORDER PLACED

Thirty Tools for German Automotive Interest Is Outstanding

List Issued by Northern Pacific—Ramapo Ajax Corporation in the Market

THE placing of an order in the Cincinnati district for approximately 30 tools by a large German automotive interest was the outstanding activity of the week. It is expected that the same company will purchase special machinery later on.

Scattered buying in fair volume, the orders being for the most part for one or two machines, may be said to have been the status of the market generally during the week. There are a number of inquiries before the trade and in some districts a fairly good volume of business is looked for within the next month.

Russian representatives are inquiring for machinery and a Japanese automotive manufacturer, which was a buyer in this market last fall, is understood to be preparing to take more equipment.

A list has been issued by the Northern Pacific Railroad. Among the several railroad lists expected in the near future is that of the New York Central, which is reported to be preparing to spend $350,000 for tools during the next few months.

The Ramapo Ajax Corporation, Chicago, is in the market for approximately $200,000 worth of tools for its various plants.

Very little business is coming from the automotive industries. Future orders from the Nash interests, which have placed the bulk of their requirements, will, it is believed, be limited to scattered individual items.

New York

NEW YORK, Jan. 20.

WHILE there are reports current that various large users of machine tools are contemplating purchases of small lots, but few new inquiries have as yet developed. A number of tools are still pending from the railroads and further purchasing from this source is expected before long. The Worthington Pump & Machinery Corporation has closed on several more tools and still has some business pending.

Recent purchasing has included both railroads and industrial users. The Southern Railway has closed on a 53-in. boring and turning mill and a 36 x 36-in. x 10-ft. planer. The Boston & Albany has purchased a 36 x 36-in. x 12-ft. planer. The Llewellyn Iron Works, Los Angeles, Cal., has placed a 42-in. rotary planer, the Hallidie Machinery Co., Seattle, Wash., a 2000-lb. steam hammer, and the General Electric Co., Schenectady, N. Y., a 23-in. x 10-ft. lathe for Litchfield, Conn.

The Rolls Royce Co., Eighth Avenue and Fifty-eighth Street, New York, with plant at Springfield, Mass., has awarded a general contract to the Austin Co., for extensions and improvements in its repair shop, Long Island City, to cost about $20,000.

The Knickerbocker Ice Co., 41 East Forty-second Street, New York, is asking bids on a general contract for a one-story ice plant on Pennington Avenue, Freeport, L. I., 60 x 120 ft. C. Leslie Wier is company architect. Charles S. Small is president.

The Argentine Department of Navigation and Ports, Buenos Aires, Argentina, is asking bids until May 27 for semi-portal, portal and wall cranes, lifts and hoists, capstans and motors, etc., for the new local port, as per specifications on file, (correspondence desired in Spanish).

Fire, Jan. 13, destroyed the plant of Sirkus Brothers, 534 Junius Street, Brooklyn, manufacturer of sash, doors and other millwork products, with loss estimated at $400,000, including machinery and stock. Tentative plans are under consideration for rebuilding.

The American Chamber of Commerce in France, 32 Rue Taitbout, Paris, has received an inquiry (M-2946) from a local company desiring to get in contact with American manufacturers of steel wheelbarrows.

The Stores Committee, Bikaner State Railway, Bikaner, India, Nihal Chand Sarwal, secretary, is taking bids until March 15 for a quantity of railroad material and supplies, and electrical equipment and stores, as per lists and specifications.

F. W. Rinn, 1646 University Avenue, New York, architect, is preparing plans for a two-story automobile service, repair and garage building on Jerome Avenue, 71 x 105 ft., to cost about $70,000.

The Dubilier Condenser & Radio Corporation, 48 West Fourth Street, New York, will soon take bids for a two-story addition to its machine and mechanical shop, 55 x 100 ft., at Bullard Avenue and 258th Street, to cost approximately $37,000. J. M. Berlinger, 469 Seventh Avenue, is architect; M. L. Kaufman, last noted address, is engineer. The company recently arranged for an increase in capital from 160,000 to 500,000 shares of stock, no par value, or to about $25,000,000 for expansion.

The Andean National Corporation, affiliated with the International Petroleum Co., 120 Broadway, New York, is completing plans for a note issue of $10,000,000, the proceeds to be used for the construction of a pipe line from the tidewater, Colombia, S. A., to the oil properties of the International company in that country.

The State Electric Light Works, Montevideo, Uruguay, will take bids until Feb. 16 for a quantity of copper wire and cable and until Feb. 17 for special cables.

Fire Jan. 11, destroyed a portion of the plant of the Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y., with loss reported at $100,000, including equipment.

The Beaux-Arts Wrought Iron Co., 552 West Broadway, New York, has leased a portion of the building at 29 East End Avenue for expansion. Another portion of the same building has been leased to the Herald Electric Co., Inc., 113 Fourth Avenue, for like service.

The Western Electric Co., 195 Broadway, New York, is completing plans for the construction of its proposed eleven-story factory, 80 x 130 ft., at 744-54 Washington Street, for the manufacture of telephone equipment, etc. It is estimated to cost $600,000. McKenzie, Voorhees & Gmelin, 342 Madison Avenue, are architects. Charles G. DuBois is president.

Cushman's Sons, Inc., 461 West 125th Street, New York, will make extensions in its two-story plant at 518-22 West Seventy-second Street, 25 x 200 ft., with the installation of conveyors and other equipment estimated to cost $55,000. George Gress, 116 West Thirty-ninth Street, is architect.

John De Hart, 1039 Fox Street, New York, architect, has completed plans for a two-story automobile service, garage and repair building, 125 x 145 ft., at Webster Avenue and 168th Street, estimated to cost $75,000.

The Union County Buick Co., 337-39 North Broad Street, Elizabeth, N. J., local representative for the Buick automobile, is asking bids on a general contract for a two-story service, repair and garage building, 40 x 100 ft., to cost approximately $45,000 with equipment. H. N. Brady, Elizabeth, is architect.

The Alpha Portland Cement Co., Easton, Pa., is said to be arranging for entire discontinuance at its mills at Alpha, N. J. The machinery will be removed, a portion to be used

at the Martins Creek, Pa., mill of the company, where operations will be concentrated for this district and future expansion carried out. Other equipment will be scrapped and buildings razed.

The Board of Education, Caldwell, N. J., is considering the installation of manual training equipment in the proposed high school, reported to cost $200,000, for which bids are being asked on a general contract until Jan. 26. Starrett & Van Vleck, 8 West Fortieth Street, New York, are architects.

The Board of Trustees, Princeton University, Princeton, N. J., has had plans drawn for a three-story building for the School of Engineering, with installation to include mechanical laboratory, with gas and steam engines, pumps, air compressors, automotive equipment, etc.; hydraulic laboratory, with hydraulic turbines, centrifugal pumps and other machinery; civil engineering laboratory, with machinery for testing materials and other mechanical apparatus.

The Public Service Electric & Gas Co., Terminal Building, Newark, N. J., is disposing of a preferred stock issue of $15,000,000, a portion of the proceeds to be used for improvements, and new power plant construction. Work is in progress on a new generating station at Kearny, N. J., with outdoor power substation, transmission lines, etc. It will cost more than $7,500,000. Thomas N. McCarter is president.

The Central Foundry Co., 131 Lockwood Avenue, Newark, has taken out a permit for extensions and improvements in its plant to cost approximately $10,000.

The Car Lighting & Power Co., Bayonne, N. J., will give over a portion of its local plant for the manufacture of a recently perfected electric-operated refrigerating cabinet. A. G. Fromuth is president.

Philadelphia

PHILADELPHIA, Jan. 19.

BIDS will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until Jan. 27 for 19,171 lb. of carbon tool steel for the Philadelphia Navy Yard, schedule 3186; also for 3000 inclosed cartridge fuses, schedule 3199.

The United Gas Improvement Contracting Co., Broad and Arch Streets, Philadelphia, a subsidiary of the United Gas Improvement Co., has acquired the plant of the Montgomery Iron & Steel Co., Ninth Street and Montgomery Avenue, on site 390 x 501 ft. for $95,000. It will be used for iron and metal-working and other service.

The Simplex Valve & Meter Co., 112 North Broad Street, Philadelphia, has awarded a general contract to the Curtis-Grimrod Co., 10 South Eighteenth Street, for its proposed one-story plant, 90 x 175 ft. Edgar A. Wightman, Bankers' Trust Building, is architect. J. W. Ledoux is vice-president.

The Keystone Industrial & Mfg. Co., 624 Market Street, Philadelphia, has acquired property, 78 x 432 ft., at Orianna and Willow Streets, for the erection of new plant.

The Pennsylvania Railroad Co., Philadelphia, is planning the construction of an addition to its engine house at Enola, Pa., with additional repair facilities.

The Philadelphia Spring Works, 1439 North Hutchinson Street, Philadelphia, manufacturer of automobile springs, is arranging for the early removal to a new plant at 1320 Poplar Street, where increased manufacturing facilities will be provided. The new works will also produce springs for motor trucks.

The Radio Plating Co., 119 North Third Street, Philadelphia, manufacturer of radio and electrical equipment, has leased space in the building at 156 North Seventh Street for new works.

The Foreign Trade Bureau, Philadelphia Commercial Museum, has received the following inquiries: (43119) from the Plaster Decoration Co., Sada Nand Suri, 35 Macleod Road, Lahore, India, desirous of getting in touch with American manufacturers of gypsum machinery for plaster-of-Paris manufacture, including crushing and grinding machinery, rotary kilns, tanks, and accessories; (43056) from R. R. Pesquera, with J. Ochoay Hermano, San Juan, Porto Rico, wishing to get in contact with American manufacturers of sugar mill equipment, especially dump cars, industrial railroad supplies, cast iron pipe, etc.; (43070) from A. Colombo Leoni, Calle Entre Rios 1019, Rosario, Argentina, wishing to get in touch with American manufacturers of galvanized barbed wire, plain and corrugated zinc, iron pipe, water pipe and fittings, iron tie rods for building purposes, tin plate, etc.; and (43108) from Crisologo Brotos, Rio Negro 1522, Montevideo, Uruguay, desiring to get in touch with American manufacturers of fiber-working machinery.

The Board of Education, Nineteenth and Ludlow Streets, Philadelphia, is planning for the installation of manual training equipment in two proposed four-story junior high schools, each estimated to cost $800,000, for which bids will be asked soon on a general contract. Irwin T. Catherine is architect for the board.

Motors, controls, conveying apparatus and other equipment will be installed in the proposed three-story and basement printing plant, 100 x 135 ft., to be erected by the Security Bank Note Co., 223 Chestnut Street, Philadelphia, to cost $85,000. The Ballinger Co., Twelfth and Chestnut Streets, is architect.

C. H. Masland & Sons, Inc., Carlisle, Pa., has plans for a two-story machine shop, 80 x 190 ft., at its woolen mill. A portion of the structure will be used for storage. Lockwood, Greene & Co., 100 East Forty-second Street, New York, is architect and engineer.

The Pennsylvania Power & Light Co., Allentown, Pa., has acquired the East Penn Electric Co., operating at Pottsville, Pa., and vicinity, with steam-operated electric power plant at Pine Forge, Pa. The new owner will consolidate with its properties, and plans extensions and the installation of additional equipment. The purchasing company has arranged for an increase in capital from 915,000 to 1,115,000 shares of stock, no par value, a portion of the fund to be used for the expansion.

The South Penn Collieries Co., Sheppton, Pa., is planning for the construction of a coal breaker at its properties near the city, and purposes to begin work early in the spring. It has acquired an additional tract of coal lands near Pottsville, Pa., and plans the installation of mining machinery for development.

The Patterson Screen Co., Towanda, Pa., has acquired the plant and business of Threkeld Edwards, 511 Seneca Street, Bethlehem, Pa., manufacturer of X-ray intensifying screens and kindred equipment, and will remove the works to its Towanda plant, where increased manufacture will be arranged.

The Papermakers' Chemical Co., Easton, Pa., manufacturer of paper mill products, has awarded a general contract to H. D. Folkenson, Easton, Pa., for rebuilding the portion of its plant recently destroyed by fire with loss reported at $100,000 including machinery. Additional equipment will be installed.

The Emanuel Slag Co., Inc., Allentown, Pa., operating plants at Easton and Catasauqua, Pa., contemplates the establishment of a new plant between Allentown and Catasauqua, for which transmission, conveying and hoisting machinery will be required. A steam power house is also under consideration.

Bids will be received by George F. Sproule, director of the Department of Wharves, Docks and Ferries, room 211, Municipal Pier No. 4, Chestnut Street, Philadelphia, until Jan. 23 for the construction with appurtenant work of elevators for Pier No. 84, South; construction of steel derrick scow No. 22; emergency work of repairing the floating plant of the department.

The Richard De Cou Co., Eleventh and Hamilton Streets, Philadelphia, is in the market for a 15- to 20-ton used eight-wheel, M.C.B., boom locomotive crane.

The Power Boiler Co., 821 Drexel Building, Philadelphia, is asking for quotations on 226-lb. castings.

Buffalo

BUFFALO, Jan. 19.

THE Curtiss Aeroplane & Motor Corporation, 74 Kail Street, Buffalo, is arranging for the manufacture of complete airplanes at its local plant, heretofore devoted exclusively to the production of motors, and will transfer operations from its Garden City, L. I., works. The Garden City plant will be used for engineering laboratory work only in the future. C. M. Keys is president.

The Plastergon Wall Board Co., 196 Philadelphia Avenue, Buffalo, will soon take bids for rebuilding the portion of its plant recently destroyed by fire, with loss reported in excess of $75,000. The new structure will be one-story, 100 x 400 ft.

The Ledyard Electric Lighting Co., Aurora, N. Y., is completing arrangements for the purchase of the local plant and system of the Aurora Electric Lighting Co., and plans extensions, including additional equipment and transmission lines.

The Board of Education, Telephone Building, Buffalo, has asked bids on a general contract for the erection of the proposed Peckham vocational school, Lovejoy and Hilton Streets, estimated to cost $300,000, with equipment. The Division of School Architecture, Old Central High School, Court and Franklin Streets, is architect.

The Crane Co., 836 South Michigan Avenue, Chicago, will soon take bids for a one and two-story factory branch and

The Crane Market

THE volume of inquiry for overhead traveling cranes is beginning to increase and, although awards of business have not been heavy in the past week, most sellers are beginning to look forward to more activity than has marked the opening weeks of the year. The Foundation Co., 120 Liberty Street, New York, is in the market for a 1½-cu. yd. bucket handling crane for Caswell, Tenn. W. S. Barstow & Co., 50 Pine Street, New York, have been obtaining bids on a 15-ton electric traveling crane for the Broad River project in Pennsylvania. The Public Service Production Co., Newark, N. J., is asking for a 15-ton hand power crane with alternate on a 20-ton, for the gas compressor house at Harrison, N. J. The Phoenix Utility Co., 71 Broadway, New York, still in the market for a 120-ton overhead crane and recent inquirer for a sluice gate hoist to lift 165,000 lb. 40 ft. in 30 minutes, has duplicated the hoist inquiry and asked for prices on two 50-ton capacity traveling gate hoists. The company is reported preparing to issue specifications for a 180-ton overhead traveling crane. Stone & Webster, Boston, Mass., are about to close on the 110-ton crane for the Columbus Light & Power Co., Columbus, Ga. The Industrial Engineering Co., 30 Church Street, New York, has been obtaining prices on a 5-ton, 83-ft. span electric crane for North Bergen, N. J.

In the Pittsburgh district the market is not active in actual orders, but builders have quoted on large numbers of cranes for the steel companies and are expecting a fair volume of business before long. Three more cranes will be needed by the Jones & Laughlin Steel Corporation for its Memphis terminal and warehouse, where a crane, previously ordered for a Pittsburgh dock project, will be installed.

Among recent purchases are:

Parrish Mfg. Co., Reading, Pa., two 5-ton, 71-ft. overhead cranes from the Shepard Electric Crane & Hoist Co. and two 10-ton, 69-ft. and 71-ft. spans from an eastern Pennsylvania builder.

General Electric Co., Schenectady, N. Y., a 5-ton, 34-ft. span, electric wall crane for Pittsfield, Mass., from the Whiting Corporation.

Eastern Malleable Iron Co., Naugatuck, Conn., reported to have closed on a 5-ton electric traveling crane for New Britain, Conn.

Anaconda Copper Mining Co., New York, a 10-ton capacity, crawl-tread crane for use in the West from a Milwaukee builder.

New York, New Haven & Hartford Railroad, New Haven, Conn., a 5-ton electric hoist, reported placed with the Shepard Electric Crane & Hoist Co.

Mill Power Supply Co., a 30-ton, 8-wheel locomotive crane for Wateree power project, Nitrolee, S. C., from the American Hoist & Derrick Co.

American Spiral Pipe Co., Chicago, a 10-ton, 3-motor, overhead crane from the Whiting Corporation.

Illinois Steel Co., Chicago, a 5-ton, 3-motor, monorail bucket trolley from the Milwaukee Electric Crane & Mfg. Co.

distributing plant at Syracuse, N. Y., to be L-shaped, 65 x 105 x 265 ft., to cost more than $75,000 with equipment. Melvin L. King, Snow Building, Syracuse, is architect. Kendall R. Ackerman is local manager.

The Board of Education, Union School District No. 5, 123 East Manlius Street, Syracuse, J. Terry, president, is considering the installation of manual training equipment in the two-story high school to be erected on Kinne Street, East Syracuse, estimated to cost $200,000. Melvin L. King, Snow Building, is architect. Bids will be asked on general contract.

The H. A. Dahlgren Co., Inc., Forest Avenue, Jamestown, N. Y., operating an automobile spring service station, is completing a one-story and basement service building on Foote Avenue, to be equipped with electrically operated machinery. Requirements will include a lathe, drill press, small punch, grinder, etc.

The Standard Oil Co., 1103 Elk Street, Buffalo, is in the market for electrically operated pumping equipment, in connection with the erection of a pumping station at its plant.

Detroit

DETROIT, Jan. 19.

PRELIMINARY plans are being considered by Wills-Ste Claire, Inc., Marysville, Mich., manufacturer of automobiles, for extensions to double the present capacity during the year. C. Harold Wills is president.

The National Radiator & Mfg. Co., Detroit, has tentative plans for an addition, for which it is proposed to break ground early in the summer. The cost is reported at $50,000. Neil M. McMillan is secretary.

The G. B. Bright Co., 2615 Twelfth Street, Detroit, architect and engineer, has plans for a new cold storage and refrigerating plant, to cost close to $750,000, with equipment, for which the owner's name is temporarily withheld. Bids will be asked on a general contract in March.

The Simplex Paper Co., Palmyra, Mich., has acquired a factory on Treat Street, Adrian, Mich., formerly used by the Utility Compressor Co., and will remodel for a new mill, at a cost of approximately $65,000.

The Hayes-Ionia Co., Grand Rapids, Mich., with second mill at Ionia, Mich., manufacturer of automobile bodies, is disposing of a bond issue of $1,000,000, a portion of the proceeds to be used for expansion, including extensions in the stamping department and the purchase of additional equipment, and the purchase of property, heretofore occupied under lease. H. Jay Hayes is president.

C. L. Frost & Son, 30 Ionia Avenue, S. W., Grand Rapids, Mich., manufacturers of hardware products, have awarded a general contract to the Paul A. Mastenbrook Co., Michigan Trust Building, for its proposed addition, to be one-story and basement, 60 x 100 ft.

The Board of Education, District No. 9, Comstock Park, Mich., is considering the installation of manual training equipment in its proposed high school, estimated to cost $115,000, for which bids will be asked on a general contract in February. Frank P. Allen & Son, Houseman Building, Grand Rapids, Mich., are architects.

The Petoskey Portland Cement Co., Petoskey, Mich., is arranging for enlargements and the installation of additional equipment to double, approximately, the present capacity. John A. Galster is secretary and treasurer, in charge.

Cleveland

CLEVELAND, Jan. 19.

THERE was a fair volume of business in machine tools the past week but almost wholly in orders for single machines. While not much is developing in the way of definite inquiries for lots of any size, machine tool builders are working on a number of good prospects and look for a satisfactory volume of business during the next few weeks. Among orders placed the past week was one from a local shop for three presses for which demand continues fairly active. Regarding the outlook for better foreign business a Cleveland machinery manufacturer who has not had direct representation abroad for some time, will send a permanent representative to Europe this month. A machinery list has been issued by the Northern Pacific Railroad on which several machines are being figured on by a local manufacturer. The present demand is well scattered among various industries outside of the automotive field, but very little business is coming either from automobile plants or parts manufacturers.

J. Kinsner & Son, 8710 Blaine Avenue, Cleveland, sheet metal manufacturers, will erect a one-story building, 120 x 180 ft. A two-ton traveling crane will be required. Best & Hoefler, 838 Keith Building, Cleveland, are the architects.

The Bennington Wax Paper Co., Bennington, Vt., has placed with the H. K. Ferguson Co., the general contract for a one-story factory and warehouse at an estimated expenditure of $100,000.

The McCaskey Register Co., Alliance, Ohio, contemplates the erection of a $400,000 plant at Mount Union, Ohio. Lockwood, Greene & Co., Hanna Building, Cleveland, are the structural engineers.

The Perfeclite Co., East Fortieth Street, Cleveland, manufacturer of electrical fixtures, is having plans prepared for a two-story and basement factory, 80 x 156 ft. Allan Sogg, 3030 Euclid Avenue, is the architect and engineer.

The Sterling Brass Co., 9600 St. Catherine Avenue, Cleveland, is preparing plans for a two-story and basement factory, 40 x 185 ft. Allan Sogg, 3030 Euclid Avenue, is the architect and engineer.

The Central Brass Mfg. Co., 6203 Cedar Avenue, Cleveland, has awarded contract for a three-story and basement

factory, 63 x 122 ft. It will include a machine shop, assembly room, plating and buffing departments and boiler room. The Bolton Pratt Construction Co., 7113 Euclid Avenue, is the general contractor.

The city of Alliance, Ohio, is preparing plans for extensions to its water supply system which will require one 12,000,000-gal. high service steam driven pump, an 8,000,000-gal. low service steam driven pump and two 300-hp. boilers. Bids will be taken April 1.

The city of Dover, Ohio, contemplates the erection of an addition to its municipal lighting plant. George E. Arnold, New Philadelphia, Ohio, is the city engineer.

The Bunting Brass & Bronze Co., Toledo, Ohio, has engaged Mills, Rhines, Bellman & Nordhoff, 1234 Ohio Building, architects, to prepare plans for extensions to its works.

The Grabler Mfg. Co., 6365 Broadway, Cleveland, has placed contract with the Bolton Pratt Construction Co. for a two-story cupola house.

Bids have been taken for a high school for the Bee Hive School District, Warrensville, Ohio, in which manual training equipment will be installed. Fulton & Taylor, 8120 Euclid Avenue, Cleveland, are the architects and engineers.

Manual training equipment will be installed in a combination high and grade school to be erected in New Albany, Ohio. F. F. Glass, 419 Pure Oil Building, Columbus, Ohio, is the architect.

Manual training equipment will be provided in a new grade and high school to be erected in Elmore, Ohio. Stophlet & Stophlet, Nasby Building, Toledo, are the architects.

The Board of Education, Galena, Ohio, is having plans prepared for a combination grade and high school, to include a manual training department. F. F. Glass, 419 Pure Oil Building, Columbus, is the architect.

A general construction contract has been awarded by the Renedy Mfg. Co., Van Wert, Ohio, manufacturer of sheet metal products and equipment, for a one-story and basement addition, 100 x 100 ft. Equipment, to include punches, shears, etc., will be required.

Pittsburgh

PITTSBURGH, Jan. 19.

MACHINE tool business is fair although running principally to one- and two-lot sales. Pending business is heavy and a good many inquiries still are coming out, but buyers appear disposed to take their own time about placing orders. Opinions are more conservative as to the outlook for general business than was noted just after the election. The rapid increase in production of primary materials and the equally rapid rise in prices has caused many to wonder if the pace was not too rapid and to create ideas that the year might turn out to be a repetition of 1924, with its early peak and subsequent sharp dip. These considerations have an influence upon purchases. It is believed that the subsidence of boom ideas will result in more stable market conditions in iron and steel and, locally, the condition of that industry has much to do with machine tools and other business.

Contract has been let by the Pittsburgh Transformer Co., Columbus and Preble Streets, Pittsburgh, to the Austin Co., for a one-story addition, 120 x 600 ft., to cost $155,000 including equipment.

The Demmler Brothers Co., 100 Ross Street, Pittsburgh, tinplate and other metal products, is arranging for a six-story and basement storage and distributing plant, 60 x 100 ft., at 106-08 Ross Street, estimated to cost $100,000 with equipment. The Hunting-Davis Co., Century Building, is architect and engineer. F. C. Demmler is president.

T. T. Pierce, J. T. Enright and D. W. Lockwood, all of Charleston, W. Va., are organizing a company to construct and operate a plant for metal-plating and kindred metal-working.

The Island Creek Coal Co., R. & P. Building, Huntington, W. Va., has awarded a general contract to Heyl & Patterson, Inc., 51 Water Street, Pittsburgh, for its proposed steel tipple. A conveyor system and other equipment will be installed. James D. Francis is vice-president.

Fire, Jan. 15, destroyed a portion of the pulp mill of the Harpers Ferry Paper Co., Harpers Ferry, W. Va., with loss reported at $150,000, including equipment. The electric power plant of the company, operated by the Harpers Ferry Electric Light & Power Co., under lease, was also partially destroyed. It is planned to rebuild both structures.

The Wheeling Steel Corporation, Wheeling, W. Va., has acquired coal lands near Mason City, W. Va., and plans the installation of electric power and mining machinery for the development of a portion of the tract. The initial cost is reported at $750,000.

Chicago

CHICAGO, Jan. 19.

MARKET activity has declined noticeably and although there are still a number of attractive inquiries before the trade, buying has been particularly light. The Nash Motors Co. placed four trimming presses in addition to the board drop hammers mentioned a week ago, but has not yet bought the two steam hammers for which it has been inquiring. The bulk of the purchases by the Nash interests are believed to have been concluded and from now on orders will be limited to scattered individual items. The Miehle Printing Press & Mfg. Co., which was a heavy buyer in December, has purchased two additional turret lathes. The General Electric Co. is inquiring for a boring mill, a turret lathe and a few other items for its Decatur, Ind., shops. The Western Electric Co., Cicero, Ill., has closed for miscellaneous tools, including an engine lathe, a shaper, and two upright drills. The Crane Co., Chicago, has closed for a 16-in. shaper.

Prospective business is still promising. The Santa Fe, the Burlington and the Illinois Central are expected to issue their long awaited lists some time in February. Inquiries from the Chicago, Milwaukee & St. Paul and the Chicago & North Western may come out at the same time, or possibly not until March. At the moment, there is little activity on the part of the railroads. The Santa Fe is inquiring for a 36-in. side head boring mill and the Pennsylvania has placed an order for a shaper for its Fort Wayne, Ind., shop and is reported to have closed for two engine lathes for the same location. The Ramapo Ajax Corporation, Chicago, is in the market for approximately $200,000 worth of tools for its various plants at Chicago and elsewhere in the country. The Chicago Board of Education has again deferred action on its inquiry for 24 engine lathes until a week hence.

Although the trade is looking for price advances rather than reductions, the Canedy-Otto Mfg. Co., Chicago Heights, Ill., has announced a downward revision of its quotations on its No. 8 D electric forge equipped with blower.

The Illinois Central Railroad will construct shops at Paducah, Ky., during the year at a cost of $6,000,000. Among the buildings to be erected are a locomotive erecting and repair shop, car repair sheds, a blacksmith shop, carpenter shops, a wood mill and a store room.

The Victor Adding Machine Co., 2900 North Rockwell Street, Chicago, has awarded contract for a three-story factory, 60 x 240 ft., to cost $150,000.

The American Ore Reclamation Co., 310 South Michigan Avenue, Chicago, has awarded contract for a five-story factory, 46 x 78 ft., at 3001-07 108th Street, to cost $42,000.

The Kerr Wire Products Co., 323 West Randolph Street, Chicago, has purchased a site on Walnut Street for a factory to cost $50,000.

The Crane Co., Forty-first Street and Kedzie Avenue, Chicago, has awarded contract for a one-story addition, 40 x 160 ft., at 4100 South Kedzie Avenue, to cost $15,000.

The Olive Can Co., 1282 Clybourn Avenue, Chicago, has awarded a contract for a two-story factory, 45 x 119 ft., at 450-452 North Leavitt Street, to cost $35,000.

Fred Mickel, 1313 South State Street, Chicago, has awarded contract for a two-story automobile truck body factory, 45 x 143 ft., to cost $28,000.

The United States Can Co., Cincinnati, has purchased 136,000 sq. ft. at 5241 West Sixty-fifth Street, Chicago, from the Clearing Industrial District, and will erect a one-story plant comprising 27,000 sq. ft. of floor space, which will be the first unit of a larger factory to be built later. The land and the building will represent an investment of $100,000.

The G. & W. Electrical Specialty Co., 7440 South Chicago Avenue, Chicago, manufacturer of high tension fuse boxes and specialties, has awarded contract to the Austin Co. for an office building, 60 x 80 ft., and a new factory unit, 72 x 320 ft., to cost $75,000.

The Joslyn Mfg. & Supply Co., 133 West Washington Street, Chicago, manufacturer of electric power line equipment, has awarded a general contract to the Abel-Howe Co., 53 West Jackson Boulevard, for its one-story plant, 130 x 210 ft., at 3700 South Morgan Street, to cost $100,000 with equipment. It will be used primarily for steel and metal galvanizing. Roswell H. Maveety, 14 West Washington Street, is architect and engineer.

The City Council, Winthrop, Minn., is having plans prepared for the reconstruction of the municipal electric light and power plant and the installation of additional equipment. It is purposed to ask bids early in the spring. Toltz, King & Day, Inc., Builders' Exchange, St. Paul, Minn., is engineer.

The Jordan Machine Co., Twenty-eighth Street and Longfellow Avenue, Minneapolis, Minn., will soon take bids for a one-story and basement machine shop addition, 70 x 120 ft. L. E. Jordan is head.

The Humboldt Cabinet Works, 4524 Fullerton Avenue, Chicago, has plans for a two-story and basement addition, 30 x 135 ft., estimated to cost $40,000, with equipment. G. Pearson, 1930 Keystone Avenue, is architect. Carl Hartmann is president.

The Iowa Southern Utilities Co., Burlington, Iowa, has arranged for a preferred stock issue of $1,000,000, a portion of the proceeds to be used for extensions and improvements in power plants and system. George M. Bethtel is president.

The Eastern Minnesota Power Co., Pine City, Minn., is said to be contemplating the construction of a new steam-operated electric power plant at Milaca, Minn., to cost $100,000. P. R. Allen is general manager.

The Board of Education, Alton, Ill., is considering the installation of manual training equipment in its proposed three-story high school estimated to cost $400,000, for which bids will soon be asked on a general contract. Royer, Danley & Smith, Flat Iron Building, Urbana, Ill., are architects.

The Wallace Flying Field Association, Davenport, Iowa, is contemplating the construction of a one-story machine shop, to replace a similar structure recently destroyed by fire.

The Board of Education, Winona, Minn., will take bids until Jan. 28, for the construction of a power house in connection with a proposed junior high school, with manual training equipment, for which bids will be received at the same time. The structures are reported to cost in excess of $200,000. Croft & Boerner, 1004 Marquette Avenue, Minneapolis, Minn., are architects.

The Rath Packing Co., Waterloo, Iowa, meat packer, has plans for a two-story and basement refrigerating plant addition, 75 x 130 ft., to cost $125,000 with equipment. Henschien & McLaren, 1637 Prairie Avenue, Chicago, are architects. J. W. Rath is president.

The Donahue Steel Products Co., 204 North Jefferson Street, Chicago, is inquiring for a ¾-in. and 1½-in. Acme continuous motion rivet machine, a 2-in. and 4-in. Acme or Ajax upsetting and forging machine, No. 55 and No. 56 Toledo trimming press, a Guillotine shear, 4-in. round, No. 60 Waterbury-Farrel thread roller, a 600-lb. and 2000-lb. board drop hammer.

Cincinnati

CINCINNATI, Jan. 19.

EXPORT business figured prominently in the machine tool industry the past week. Several representatives of a large German automotive manufacturer visited Cincinnati and placed orders for approximately 30 tools, including lathes, planers, drilling and milling machines. It is expected that later on further orders for special machinery will be placed. The Carnegie Steel Co. also was a buyer for its McDonald plant at Youngstown. Other orders included one for eight lathes by a Moline, Ill., manufacturer. Buying is scattered, all sections of the country participating, and all industries being represented. No prominent inquiries are current.

A Japanese automotive manufacturer, which placed substantial orders for equipment in this country during the fall is understood to be preparing to make additional purchases. Russian representatives are inquiring for various types of machinery and the large electrical companies are in the market for an assortment of tools. The New York Central Lines are reported to be preparing to spend approximately $350,000 for machine tool equipment during the next few months.

The Milton Iron Co., Wellston, Ohio, is arranging for the erection of a plant to manufacture ingot molds. It proposes to use direct metal from its blast furnace and contemplates a production of 70 to 100 tons per day. Capitalization of the company was recently increased to $600,000 to take care of the expansion. H. S. Willard, Jr., is president.

The Shartle Machine Co., 359-369 Dublin Avenue, Columbus, Ohio, is in the market for one 1350, one 1500 and one 2000 cu. ft., two-stage, motor-driven, air compressor of standard make. The motors are to be three-phase, 60-cycle, 440 or 2300 volts.

The Board of Education, South Charleston, Ohio, is considering the installation of manual training equipment in its proposed high school estimated to cost $175,000, for which it is expected to soon ask bids on a general contract. Walker & Norwick, American Building, Dayton, Ohio, are architects.

The Mississippi River Commission, P. O. Box 1017, Memphis, Tenn., is taking bids until Jan. 27 for two marine watertube boilers, with superheaters, and accessories, for the United States dredge, Gamma, circular 47; until Jan. 29 for one turbo-centrifugal circulating water pumping set, with one auxiliary condenser, one evaporator, and one complete drinking water evaporating and distilling plant, circular 48.

The Southland Portland Cement Co., Volunteer Life Building, Chattanooga, Tenn., has acquired 9000 acres in Cumberland county, vicinity of Crab Orchard, Tenn., as a site for a new mill, estimated to cost $1,200,000. Work on the first unit will be completed before the other two are built. James O. Parker is president, and Oscar Mather of the Volunteer Life Insurance Co., Chattanooga, treasurer.

The Knoxville Power & Light Co., Knoxville, Tenn., has disposed of a preferred stock issue of $495,000, a portion of the proceeds to be used for extensions and improvements in power plants and system.

Rendigs, Panzer & Martin, Southern Ohio Bank Building, Cincinnati, architects, have plans for a two and three-story automobile service, repair and garage building, 46 x 190 ft., estimated to cost $80,000, for which bids will be asked on a general contract.

Milwaukee

MILWAUKEE, Jan. 19.

BUSINESS in machine tools continues to be made up largely of inquiries. Foundries and machine shops are experiencing a revival of inquiry from railroads, and the machine-tool industry likewise is expecting to derive considerable benefit from this source. Employment, an important index, is favorable. Fifty Milwaukee industries employing 29,140 on Dec. 15, were using 30,096 men on Jan. 15, the peak point since last May.

The Belle City Mfg. Co., Racine, Wis., contemplates enlargement of its plant and equipment, having purchased the exclusive production rights to the Johnson Trackpull attachment for Fordson tractors from the A. C. Johnson Products Co., Racine. It also plans enlargement of its output of individual threshers and silo filling units. John Reid, Jr., is president and general manager.

The Alliance Investment Co., 117 Wisconsin Street, Milwaukee, identified with the Val. Blatz Brewing Co., has engaged Robert A. Messmer & Brother, architects, 221 Grand Avenue, to prepare plans for a manufacturing building, 120 x 122 ft., five stories and basement. The name of the occupant is withheld for the present. Work will start March 1 and the building is to be ready about July 1.

Lloyd E. Pitner, 939 College Avenue, Racine, Wis., has acquired the Wisconsin rights to the Crozier-Straub process for manufacturing building blocks from cinders, and is organizing a $125,000 corporation which will have headquarters in Milwaukee and establish a plant costing $100,000. A site in Milwaukee has been purchased and construction will start March 1.

The United States Engineer Office, Government Building, Milwaukee, is in the market for an automatic, gas-engine driven electric lighting unit of 1500 watts capacity, for the government locks at Kaukauna, Wis.

The Eau Claire, Wis., Board of Education has accepted sketches by E. J. Hancock, local architect, and engaged him to prepare plans for a new senior high school and for remodeling the present building into a junior high and vocational training school. The Common Council has appropriated $660,000 for the work. Fred Stussy, 308 Madison Street, is chairman of the board.

The Phillips-Pilson Refrigerating Co., Milwaukee, has been organized by William Phillips and David Pilson, 600 Jefferson Street, to manufacture artificial ice and refrigerating machinery. A small unit for domestic use has been developed and is to be placed in production immediately. Factory quarters will be leased.

The Bonduel, Wis., Village Board of Trustees has engaged McMahon & Clark, consulting engineers, Menasha, Wis., to design and supervise the entire construction of a new fire protection system, which will require a quantity of machinery, pumps, motors, etc., cast iron pipe, standpipe and auxiliaries.

The Township Board of Allouez, Brown County, Wis., has set aside $100,000 for the construction and equipment of a complete water works and fire protection system, and has engaged McMahon & Clark, consulting engineers, Menasha, Wis., to handle the project.

St. Louis

ST. LOUIS, Jan. 19.

A CONSTRUCTION and improvement program is being arranged by the Marquette Cement Mfg. Co., 140 South Dearborn Street, Chicago, at its mill at Camp Girardeau, Mo., to consist of buildings and equipment for about 50 per cent increase in output. It will include a new kiln and accessory equipment, waste heat boilers and additional turbine in the power house. F. S. Richards is plant superintendent.

The Community Power & Light Co., Poplar Bluff, Mo., is disposing of a preferred stock issue of $1,000,000, a portion of the proceeds to be used for the purchase of additional properties and equipment. Wiley F. Cori is president.

The DeVasher Motor Co., 4041 Broadway, Kansas City, Mo., has leased property at Broadway and Archibald Streets and plans the erection of a two-story service, repair and garage building, to cost $75,000 with equipment. G. B. Franklin, Reliance Building, is architect.

The Common Council, Salem, Mo., contemplates the installation of a pumping plant, steel tank and tower and other equipment in connection with a proposed waterworks, estimated to cost $90,000. Bids are expected to be asked in February. The Alexander Engineering Co., Woodruff Building, Springfield, Mo., is engineer.

The Mechanical Arts Department, Lincoln University, Jefferson City, Mo., F. C. Hearlold, director, is said to be planning for the installation of machine tools and other machine shop equipment.

The Missouri-Pacific Railroad Co., St. Louis, is reported to have arranged an appropriation of $1,000,000 for the construction of locomotive and car repair shops, and terminal facilities in the vicinity of Alexandria, La.

The Southwest Power Co., McAlester, Okla., has issued bonds for $1,000,000, a portion of the proceeds to be used for extensions in power plants and system. The company is operated by the Albert Emanuel Co., Inc., 61 Broadway, New York. Elbert Emanuel is president.

The Board of Education, Library Building, Kansas City, Mo., plans the installation of manual training equipment in the three-story senior high school to be erected at Sixty-Fifth Street and Wornall Road, estimated to cost $1,500,000. Bids will be asked at once on a general contract. C. Smith, 602 Finance Building, is architect.

The New States Ice Co., 2 West Third Street, Oklahoma City, Okla., is arranging for a one-story ice-manufacturing plant on Poplar Street, estimated to cost $140,000 with machinery. Ophuls & Hill, 112 West Forty-Second Street, New York, are architects and engineers.

The De Soto Oil Co., Augusta, Ark., is contemplating rebuilding the portion of its plant recently destroyed by fire with loss estimated at $100,000, including equipment.

The Missouri Power & Light Co., Boonville, Mo., is arranging for the construction of a steam-operated electric generating plant during the year, estimated to cost $200,000 with equipment. I. W. Long is manager.

Indiana

INDIANAPOLIS, Jan. 19.

THE Interstate Public Service Co., Indianapolis, is arranging a construction and improvement program during 1925 to cost about $3,000,000. It will include expansion in the steam-operated electric generating plant of the Indiana Power Co., an affiliated organization, at Edwardsport, Ind., with the installation of a 10,000 kw. steam turbo-generator, and accessory equipment; initial work on two projected hydroelectric power plants on the Tippecanoe River, near Goshen, Ind.; the construction of a steel tower transmission line in the vicinity of Bedford and Bloomington, Ind., and other expansion. Harry Reid is president.

The Hoover-Bowers, Co., Indianapolis, has arranged for the establishment of works at 3220 East Michigan Street for electric equipment repairs, parts manufacture, etc.

The Home Packing & Ice Co., First and Chestnut Streets, Terre Haute, Ind., has plans for a one-story and basement addition, 65 x 145 ft., estimated to cost $50,000. W. H. Floyd, 523 Ohio Street, is architect and engineer.

The Central Lumber & Mill Co., 247 Calumet Street, Hammond, Ind., is taking bids on general contract for two one-story additions, 100 x 100 ft. and 60 x 135 ft. respectively. MacTurner, Inc., 629 Hohman Street, is architect. W. G. Paxton is president.

The Board of School Trustees, Portland, Ind., is planning for the installation of manual training equipment in connection with a proposed high school estimated to cost $145,000. Nicol, Scholer & Hoffman, Ross Building, Lafayette, Ind., are architects.

The Allred Mfg. Co., Indianapolis, manufacturer of sheet metal products, has arranged for the removal of its plant from 501 Madison Avenue to 1018 South Harding Street, where increased facilities will be provided. The company recently succeeded to the plant and business of the Sullivan-Geiger Co.

South Atlantic States

BALTIMORE, Jan. 19.

A BUILDING at Pratt and Grant Streets, Baltimore, has been acquired by the New Era Elevator & Machine Co., 111 Grant Street, which will be remodeled for a new plant.

The Board of Education, Baltimore, plans the installation of manual training equipment in the proposed three-story high and grade school to be erected in the Gwyns Falls section, estimated to cost $1,000,000, for which bids will be asked on a general contract early in the spring. Joseph E. Sperry, Calvert Building, is architect; H. F. Doelemann, 507 North Charles Street, is engineer.

The chief of air service, United States Army, Washington, will take bids until Feb. 2 for miscellaneous aircraft parts and accessories, including universal joints, yoke drivers, valve assemblies, etc., circular CAS 77.

The Southern Industrial Sales Co., 59 Walnut Street, Asheville, N. C., William O'Neill, Jr., general manager, has inquiries out for a grinding mill for pulverising talc, soapstone and kindred products.

The general purchasing officer, Panama Canal, Washington, will take bids until Feb. 7 for electric hoists and motor-driven trolleys, iron, steel, brass, brass tubing, screws, nuts, nails, barbed and soft steel wire, steel rope, chain blocks, and other products, Panama circular 1651.

The R. S. Armstrong & Brother Co., Atlanta, Ga., machinery dealer, has inquiries out for a 3-kw. belt-driven electric generator, 110 volts, d.c., with accessories.

The Southern Can Co., 717 South Wolfe Street, Baltimore, has taken title to property at Wolfe and Lancaster Streets for $250,000, to be used in connection with its plant.

The City Council, Siler City, N. C., will receive bids until Jan. 30 for equipment for a municipal waterworks, including pumping machinery, 100,000-gal. steel tank and tower, cast iron pipe, etc., as per specifications at the office of Spoon & Lewis, American Bank Building, Greensboro, N. C., engineers.

O. K. David, Marshallville, Ga., has inquiries out for a 30 to 40-hp. steam engine, boiler and accessory apparatus for a local power plant.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until Feb. 3 for 200 gross of brass machine screws for the Puget Sound Navy Yard, schedule 3189, and for 69,450 lb. steel floor plates for Mare Island yard, schedule 3182.

The City Council, Elizabeth City, N. C., has plans for extensions and improvements in the electric light and power house, waterworks and sewage plant, recently acquired, also the installation of additional machinery, to cost $250,000.

The Hackley Morrison Co., 1708 Lewis Street, Richmond, Va., machinery dealer, has inquiries out for one 6-in. centrifugal pump, 750 gal. per min. capacity, with three-phase, 60-cycle, 220-volt motor; also one 75-hp. motor, three-phase, 60-cycle, 220 volts, and for a quantity of relaying rails, with angle bars, etc.

The Board of Education, Roxboro, N. C., plans the installation of manual training equipment in a proposed two-story high school estimated to cost $100,000. Northup & O'Brien, Starbuck Building, Winston-Salem, N. C., are architects.

The United Railways & Electric Co., Continental Building, Baltimore, is arranging a construction and improvement program to include a fund of $610,000 for extensions in plants, shops and equipment, and $925,000 for the purchase of maintenance materials and supplies. C. D. Emmons is president.

The High Point Furniture Co., High Point, N. C., is in the market for a 300 to 350-kw. direct-connected engine and generator, a.c. current, three-phase, 60-cycle.

C. C. Coddington, Inc., 432 West Trade Street, Charlotte, N. C., has awarded a general contract to the Realty Construction Co., Wilmington, Del., for a five-story automobile service, repair and garage building, 100 x 200 ft., estimated to cost $500,000 with machinery. The top floor of the structure will be equipped for heavy repair and machine work. Albert Kahn, Marquette Building, Detroit, is architect.

Icy-O Co., Inc., Johnston Building, Charlotte, N. C., newly organized to manufacture beverage dispensers, is prepared to receive bids for the manufacture of its product. It plans to manufacture 10,000 or more per year. The product will be made of Nos. 20, 24 and 26 gage galvanized sheets. E. C. Stothall is vice-president and general manager.

The Gulf States

BIRMINGHAM, Jan. 19.

PLANS are being completed by the Alabama Lime & Stone Corporation, 1302-6 First Avenue, Birmingham, recently organized, for its proposed works in the vicinity of Calera, Ala. It will include a complete electric-operated crushing plant, stone products plant, carbide works, chemical and by-products plant, estimated to cost $500,000 with machinery. The company has taken over the properties of the O'Neals Lime Works, Inc., in this district, and those of the Calera Development Co. John H. Adams is president and general manager.

The Texas Utilities Co., Ballinger, Tex., is contemplating the construction of a one-story ice-manufacturing plant at Post, Tex., estimated to cost $35,000 with equipment.

The Frio Cotton Oil Mill Co., Pearsall, Tex., has preliminary plans for extensions and improvements in its works with the installation of crushing and other machinery estimated to cost $45,000.

The American Light & Power Co., 71 Broadway, New York, is considering extensions and improvements in its power plant and system at Okeechobee, Fla., recently acquired, including the installation of additional equipment. The transmission lines will be extended.

The Illinois Wire & Mfg. Co., Joliet, Ill., is said to be considering the erection of a branch plant at Lufkin, Tex.

The Board of Education, El Paso, Tex., has plans for a two-story vocational school estimated to cost $135,000, for which it will soon ask bids. Trost & Trost, Two Republics Building, are architects.

The Kerens Cotton Oil Mill Co., Kerens, Tex., is contemplating rebuilding the portion of its plant recently destroyed by fire with loss of $20,000, including equipment.

The Buckeye Stone Co., Houston, Tex., is considering the construction of a new stone-crushing plant in the vicinity of Tehuacana, Tex., with branch mill for the production of lime, estimated to cost $50,000 with machinery.

Ovens, power equipment, conveying and other machinery will be installed in the proposed plant to be erected by the Southern Baking Co., 214 West Eleventh Street, Jacksonville, Fla., estimated to cost $325,000 with equipment. Byron C. Dorsey is general manager.

The Texas-Kansas-Pacific Railroad Co., Fort Worth, Tex., is said to be planning for enlargements in its local engine house and shops and the installation of equipment. The work will be carried out in connection with proposed improvements in the local yards, with entire project to cost approximately $250,000.

Contract has been awarded by the Texas Central Light & Power Co., Frost Building, San Antonio, Tex., for the erection of an ice manufacturing plant and power station at Walnut Ridge, Ark., to cost $60,000, exclusive of equipment. J. Marriott, Frost Building, San Antonio, is architect and engineer.

The Oil Well Accessories Corporation, Ranger State Bank Building, Ranger, Tex., has been organized to manufacture a new pump jack for oil wells and related products. The jack will be of steel construction embodying a combination of steel castings and shapes, machined and assembled. A snuffer to be made of machined steel castings also will be turned out. All manufacturing will be done on contract. Inquiries should be addressed to Box 1056, Ranger, Tex. L. A. Vandervoort is president.

Canada

TORONTO, Jan. 19.

MACHINE-TOOL business is not picking up as rapidly as was expected. Sales the past week were mostly for one or two tools. From some quarters inquiries are more numerous and dealers report a good prospective demand, the greater portion, however, not asking for delivery under six weeks. The American Radiator Co., Dufferin Street, Toronto, whose plant was recently damaged by fire will require a number of tools, but specifications have not yet been issued. The Northern Bolt, Screw & Wire Co., Owen Sound, Ont., will also require tools to replace those damaged in its recent fire. The demand from automobile manufacturers has fallen off since the first of the year, but a resumption of buying from this quarter is looked for within the next two or three weeks. A fair demand exists for equipment for garages and repair plants.

The Cunningham Furnace & Machinery Co., London, Ont., has been incorporated to take over the business of the Cunningham Industrial Furnace Co. The new concern proposes to build special machinery used in conjunction with electric ovens and to make other lines of equipment. The expansion includes the buying of the Yeates Machinery Co., and the transfer of the machinery, stock, etc., to the York Street plant, which will be enlarged. The company will also act as distributors of machine tools and supplies used in this part of the Province and has already made arrangements for handling several lines. It is estimated that the initial expenditure on machine tools, shafting and other supplies will amount to about $50,000. The mechanical department will include engineering, pattern making, sheet metal, electrical, and facilities for designing and building the special machinery. A branch plant will be opened in Port Huron in the near future. R. H. Cunningham is president, and J. W. Cunningham, secretary-treasurer. O. I. Cunningham, E. G. Yeates, and E. C. Mitchell, are directors.

Shareholders of the Wayagamack Pulp & Paper Co., Montreal, have authorized the company's entry into the manufacture of newsprint and a new mill will be erected on Wayagamack Island. Under the proposed plans a mill with a capacity of 200 tons per day will be erected.

The Empire Brass Mfg. Co., London, Ont., is in the market for a No. 7 manufacturers' equipment, collapsible tap.

Mussens, Ltd., Montreal, is in the market for a 1000 or 2000-ton hydraulic press.

Preliminary work has been started by the McIntyre-Porcupine Mines, Timmins, Ont., in connection with the erection of a larger mill.

The Burgess Battery Co., Ltd., Niagara Falls, Ont., is erecting an addition to its plant to cost $44,000. Some equipment will be purchased.

It is reported that the Singer Mfg. Co., St. Johns, Que., manufacturers of sewing machines, power tables, etc., proposes to build an addition to its plant at Thurso, Que.

The S.K.F. Co., Toronto, manufacturer of roller bearings, etc., has secured a site on Bay Street, where it proposes to erect a new building.

The Regal Oil Corporation will build an oil refinery at Tillsonburg, Ont., in the spring. The first unit will represent an expenditure of $250,000. The process to be used is the Dubbs oil cracking process. The company is a subsidiary of a Louisiana concern, and will import most of its crude oil from wells in that State.

The Production Materials, Ltd., 165 Dufferin Street, Toronto, is asking for prices on a steel tank of 7000 or 8000 gal. capacity; also a 1000-gal. per hour oil pump, together with necessary pipes and valves for an oil blending plant.

The Department of National Defense, Ottawa, Ont., will build an arsenal to cost $2,000,000 on the eastern shore of Bedford Basin, Halifax, N. S. The plant will be built in units and will consist of 44 reinforced concrete buildings, a central heating plant, power house, etc.

The New Brass Ware Co., Montreal, will build an addition to its foundry to cost $16,000. The Marotta Construction Co., has the general contract and the Dominion Bridge Co. will supply the steel; other contracts are still open.

Pacific Coast

SAN FRANCISCO, Jan. 14.

PLANS are being prepared by the San Diego Electric Railway Co., San Diego, Cal., for a group of shop buildings for repair and parts production, with main one-story machine shop, wood-working and metal-working shops, to cost $175,000, with equipment. E. M. Hoffmann and G. A. Hanssen, Speckels Building, are associated architects.

The Richmond Construction & Engineering Co., Richmond,

Cal., recently organized, has secured about 3 acres at the foot of Third Street, inner harbor, for a shipbuilding and repair plant. The company is headed by Alfred Narfe and J. C. Lengille, the latter being formerly general manager at the shipyard of the A. W. DeYoung Shipbuilding Co., Oakland, Cal.

The Olympia Pulp & Paper Co., Olympia, Wash., has work under way on remodeling and improving the former plant of the Tumwater Brewing Co. for a proposed paper and pulp mill, and plans the early installation of machinery, including electric power equipment.

The Utah-Idaho Sugar Co., Salt Lake City, Utah, will soon begin the construction of a new beet sugar refinery at Bellingham, Wash. It will consist of several units, with power house and machine shop, and is estimated to cost $1,250,000 with equipment. W. Y. Cannon is chief engineer.

The General Petroleum Co., 210 Sansome Street, San Francisco, will soon begin the erection of a new storage and distributing plant at the Parr Terminal, Oakland, to consist of six main buildings estimated to cost $650,000 with equipment. The engineering department of the company is in charge. Plans are also under consideration for a similar plant at Islais Creek, San Francisco, comprising three main units each 65 x 120 ft., with tanks and pipe line, to cost $350,000 with equipment.

The Masterbilt Wall Fixture Co., Santa Barbara, Cal., recently organized by C. H. Boyd, manager Santa Barbara Lumber Co., and associates, has preliminary plans for the erection of a plant for the manufacture of special wood and metal equipment for domestic service.

The City Council, Richmond, Cal., has plans for a one-story machine and mechanical shop at the municipal corporation yards, estimated to cost $20,000 with equipment.

The National Ice & Cold Storage Co., Postal Telegraph Building, San Francisco, is contemplating the erection of a new ice-manufacturing plant at Yuba City, Cal., estimated to cost $55,000 with equipment.

The White Truck Co., 1490 Market Street, San Francisco, manufacturer of motor trucks, parts, etc., will soon begin the erection of a one-story plant totaling 50,000 sq. ft. of floor area, to cost in excess of $80,000. H. H. Gutterson, 1490 Powell Street, is architect.

New England

BOSTON, Jan. 19, 1925.

BUYING of machine tools in this territory is not developing as fast as dealers anticipated. In addition, inquiries are decreasing also. Current business is still confined to a single tool here and there, about equally divided between new and used equipment. Used tool dealers state that auction sales, mostly of surplus equipment by New England industrial companies, are growing more numerous, and quite a few prospective customers have been lost as a result of these auctions. In some cases it has been necessary for used machinery dealers to include equipment of the buyer in making sales. Price concessions also have been made on new tools rather than lose a customer. Among the few sales reported the past week, that of a new 36-in. planer to a Springfield, Mass., shop, a used 20-in. shaper to another Springfield shop, and a 16-in. x 8 ft. lathe to a New Hampshire firm are perhaps the most important. The market for small tools is moderately active. The crane market is quiet.

One encouraging feature in the New England machine tool situation is the steady improvement in textile circles. Manufacturers of textiles, following a long period of inactivity, are beginning to show signs of life, and textile machinery makers in turn are more optimistic. One textile machinery maker has instructed its buying department to cover on sufficient raw material to carry through 1925. Machine-tool dealers feel that machinery makers will purchase metal-working equipment as soon as plants are running full.

The situation among machine tool builders appears somewhat mixed. Some makers see an improvement although it is comparatively slight, and others say business is no better. Collectively, manufacturers appear slightly better off than during the last quarter of 1924.

The Chapman Valve Mfg. Co., Springfield, Mass., has indefinitely postponed the erection of a machine shop.

Plans are in progress for a new turbine building contemplated by the Narragansett Electric Light Co., Providence, R. I. Jenks & Ballou, 10 Weybosset Street, are the architects.

Bids are going in on a technical high school to be erected by Newton, Mass., to cost with equipment $750,000. George M. Angier is chairman of the school commission. Haven & Hoyt and E. W. Deering Associates, 220 Devonshire Street, Boston, are the architects.

A new electrical power development, to cost approximately $1,000,000, in which the Farmington River is to be harnessed at Rainbow, in the town of Windsor, Conn., is to begin immediately by the Farmington River Power Co., controlled by the Stanley Works, New Britain, Conn. Most of the power output will be used by the New Britain company.

The Maine Central Railroad Co., Portland, Me., is said to be planning to rebuild the portion of its freight car repair shops at Waterville, Me., destroyed by fire Jan 9 with loss estimated at $30,000 including equipment.

Alexander D. Boyle, 27 School Street, Boston, architect, has plans for a two-story automobile service, repair and garage building, 100 x 140 ft., at 995 Blue Hill Avenue, Dorchester, estimated to cost $70,000 with equipment.

The E. Ingraham Co., North Main Street, Bristol, Conn., manufacturer of clocks and clock movements, has acquired 3½ acres opposite its present plant to be used for later expansion. Plans for new buildings have not as yet been authorized.

The Central Maine Power Co., Augusta, Me., has acquired a power site on the Androscoggin River, near Clark's Rips, and has preliminary plans under way for a new hydroelectric generating station. The company will dispose of 10,505 shares of preferred stock, a portion of the proceeds to be used for expansion.

The Weston Box Co., Lynn, Mass., recently organized with a capital of $50,000 by C. Lester Weston and Arthur S. Putnam, both of Lynn, is arranging for a plant for the manufacture of paperboard boxes and containers.

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Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of items the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE, under the general heading of "Iron and Steel Markets" and "Non-Ferrous Metals."

Bars, Shapes and Plates

	Per Lb.
Bars:	
Refined iron bars, base price	3.24c.
Swedish charcoal iron bars, base	7.00c. to 7.25c.
Soft steel bars, base price	3.24c.
Hoops, base price	4.49c.
Bands, base price	3.99c.
Beams and channels, angles and tees, 3 in. x ¼ in. and larger, base	3.34c.
Channels, angles and tees under 3 in. x ¼ in., base	3.24c.
Steel plates, ¼ in. and heavier	3.34c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	3.20c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	3.55c.
Toe-calk, ½ x ⅝ in. and larger	4.20c.
Cold-rolled strip, soft and quarter hard	7.00c.
Open-hearth spring steel	4.50c. to 7.00c.
Shafting and Screw Stock:	
Rounds	4.15c.
Square, flats and hex	4.65c.
Standard tool steel, base price	15.00c.
Extra tool steel	18.00c.
Special tool steel	23.00c.
High-speed steel, 18 per cent tungsten	70c.

Sheets

Blue Annealed

	Per Lb.
No. 10	3.89c.
No. 12	3.94c.
No. 14	3.99c.
No. 16	4.09c.

Box Annealed—Black

	Soft Steel C. R. One Pass Per Lb.	Blued Stove Pipe Sheet Per Lb.
Nos. 18 to 20	4.30c. to 4.45c.	.....
Nos. 22 and 24	5.15c. to 5.35c.	
No. 26	4.50c. to 4.65c.	5.15c.
No. 28*	4.60c. to 4.75c.	5.25c.
No. 30	4.70c. to 4.95c.	.....

Galvanized

	Per Lb.
No. 14	4.70c. to 4.85c.
No. 16	4.85c. to 5.00c.
Nos. 18 and 20	5.00c. to 5.15c.
Nos. 22 and 24	5.15c. to 5.30c.
No. 26	5.30c. to 5.45c.
No. 28*	5.60c. to 5.75c.
No. 30	6.10c. to 6.25c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

Welded Pipe

Standard Steel	Black	Galv.	*Wrought Iron*	Black	Galv.
½ in. Butt...	46	29	½ in. Butt...	4	+19
¾ in. Butt...	51	37	¾ in. Butt...	11	+ 9
1-3 in. Butt..	53	39	1-1½ in. Butt.	14	+ 6
2½-6 in. Lap.	48	35	2 in. Lap....	5	+14
7 & 8 in. Lap.	44	17	3-6 in. Lap...	11	+ 6
11&12 in. Lap.	37	12	7-12 in. Lap..	3	+16

Bolts and Screws

Machine bolts, cut thread, 45 and 10 per cent off list
Carriage bolts, cut thread, 35 to 35 and 10 per cent off list
Coach screws, 45 and 10 per cent off list
Wood screws, flat head iron, 75, 20, 10 and 5 per cent off list

Steel Wire

BASE PRICE* ON No. 9 GAGE AND COARSER	Per Lb.
Bright, basic	4.25c. to 4.50c.
Annealed soft	4.50c. to 4.75c.
Galvanized annealed	5.15c. to 5.40c.
Coppered basic	5.15c. to 5.40c.
Tinned soft Bessemer	6.15c. to 6.40c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	19⅝c. to 20⅝c.
High brass wire	20⅛c. to 21⅛c.
Brass rods	17⅝c. to 18⅝c.
Brass tube, brazed	27⅝c. to 28⅝c.
Brass tube, seamless	24¼c. to 25¼c.
Copper tube, seamless	25¼c. to 26¼c.

Copper Sheets

Sheet copper, hot rolled, 23c. to 24c. per lb. base.

Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.

Tin Plates

Bright Tin			Coke—14 x 20		
	Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20		Prime	Seconds
			80 lb...	$6.15	$5.90
			90 lb...	6.30	6.05
			100 lb...	6.45	6.20
IC..	$11.25	$8.85	IC..	6.65	6.40
IX..	12.85	10.85	IX..	7.85	7.60
IXX..	14.40	12.55	IXX..	9.00	8.75
IXXX..	15.75	13.85	IXXX..	10.35	10.10
IXXXX..	17.00	15.05	IXXXX..	11.35	11.10

Terne Plates

8 lb. coating, 14 x 20

100 lb.	$7.00 to $8.00
IC	7.25 to 8.25
IX	8.25 to 8.75
Fire door stock	9.00 to 10.00

Tin

Straits, pig	63c.
Bar	68c. to 70c.

Copper

Lake ingot	16¾c.
Electrolytic	16½c.
Casting	16 c.

Spelter and Sheet Zinc

Western spelter	9¼c.
Sheet zinc, No. 9 base, casks	12c. open 12½c.

Lead and Solder*

American pig lead	11¾c. to 12¾c.
Bar lead	15c.
Solder, ½ and ½ guaranteed	43½c.
No. 1 solder	41c.
Refined solder	35c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.	75c. to 90c.
Commercial grade, per lb.	35c. to 50c.
Grade D, per lb.	25c. to 35c.

Antimony

Asiatic	20c.to 21c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb	36c.

Old Metals

The market is generally unchanged. Dealers' buying prices are as follows:

	Cents Per Lb.
Copper, heavy crucible	12.75
Copper, heavy wire	12.50
Copper, light bottoms	10.50
Brass, heavy	8.00
Brass, light	6.75
Heavy machine composition	9.50
No. 1 yellow brass turnings	9.00
No. 1 red brass or composition turnings	9.00
Lead, heavy	9.00
Lead, tea	7.25
Zinc	4.75
Cast aluminum	17.00
Sheet aluminum	17.00